SEPTEMBER 3, 1955 PAGES 463 TO 516

THE LANCET.

Offices: 7, ADAM STREET, ADELPHI, W.C.2

Telegrams: LANCET, RAND, LONDON **Telephone:** TEMPLE BAR 7228 and 7229

No. X OF VOL. II, 1955 LONDON, SATURDAY, SEPTEMBER 3, 1955 **Pp. 112—Price 1s. 6d.**
No. 6888 VOL. CCLXIX Founded 1823 PUBLISHED WEEKLY Registered as a Newspaper Annual Subscription: £3 3s.

The Climacteric
22 SEP 1955
Cont. Copy

"... A mixture of the male and female hormones was more efficacious than oestrogen alone."
BRIT. MED. JOURN., 1953 (JULY 25), 2, 214

'MEPILIN'
TRADE MARK

Each Mepilin Tablet and each teaspoonful (4 ml.) of Mepilin Elixir contains ethinylœstradiol 0.01 mg. and methyltestosterone 3 mg.

TABLETS Bottle of 25 at 4/4 and 100 at 13/6
ELIXIR Bottle of 4 fl. oz. at 6/- and 20 fl. oz. at 23/-
Basic N.H.S. prices

Literature and specimen packings are available to physicians on request

THE BRITISH DRUG HOUSES LTD. (Medical Department). LONDON N.1

Just Issued.

THE GENESIS AND PREVENTION OF CANCER

By W. SAMPSON HANDLEY, M.S., F.R.C.S.
Consultant Surgeon to the Middlesex Hospital

Second Edition with 2 new chapters 21s. net.

London: John Murray. New York: The Macmillan Co.

THE LAW AND ETHICS OF DENTAL PRACTICE

By R. W. DURAND, M.R.C.S., L.R.C.P.
Formerly Secretary of the Medical Protection Society
and
D. MORGAN, L.D.S. (Leeds)
Formerly Deputy Dental Secretary of the British Dental Association

Foreword by Professor R. V. BRADLAW, M.D.S. Dunelm, F.D.S., M.R.C.S. Eng.
Professor of Oral Pathology, Durham University
Director, Newcastle-upon-Tyne Dental School

Expert guidance on the many problems which confront the dentist

Demy 8vo 98 + viii Price 7s. 6d. net, plus 4d. postage
Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

DISABILITIES AND HOW TO LIVE WITH THEM by 55 Patients

Demy 8vo 252 pages Price 10s. 6d. net, plus 6d. postage

"... it is because these essays remind us so vividly of suffering man that the book has an especial value for all doctors. . . .The book should become a classic."
—Review in *British Medical Journal.*

The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2

DISEASES OF THE EAR, NOSE AND THROAT IN CHILDREN

By T. G. WILSON, M.B., F.R.C.S.I.
Ear, Nose and Throat Surgeon, Dr. Steevens' Hospital, Dublin

296 pages 136 illustrations Prospectus available 70s. net

Wm. Heinemann Medical Books Ltd., Gt. Russell-street, W.C.1

MANAGEMENT OF BURNS

Six articles prepared by a subcommittee of the BRITISH ASSOCIATION OF PLASTIC SURGEONS
Reprinted from THE LANCET *with an appendix*

These articles record the practice of surgeons who are treating burns every day and who see the good results of treatment that is carefully planned from the start. Here is their plan, fully but briefly set out.

48 pages Price 2s. 6d. (postage 4d.)

The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2

TECHNIQUES IN PHYSIOTHERAPY

Edited by
F. L. GREENHILL, S.R.N., M.C.S.P., T.H.T.
Sister-in-Charge, Medical Rehabilitation Unit, Royal Free Hospital; Late Sister-in-Charge, Rehabilitation Unit, Hill End E.M.S. Hospital (St. Bartholomew's); Former Member Council of Chartered Society of Physiotherapy.

Assisted by
C. B. HEALD, C.B.E., M.D., F.R.C.P., in Rheumatism and Arthritis.
J. N. BARRON, F.R.C.S., in Burns and Injuries of the Hand.
Mr. J. COLSON, M.C.S.P., M.A.O.T., Occupational Therapy in Medicine and Surgery.

Demy 8vo Pages 222 + x 8 plates 34 figures
12s. 6d. net, plus 7d. postage.

Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

IMPORTANT NEW BOOKS

A New Book

BIOCHEMISTRY AND THE CENTRAL NERVOUS SYSTEM

Just Ready

By H. McILWAIN, Ph.D., D.Sc., Professor of Biochemistry, University of London.
(Institute of Psychiatry, Maudsley Hospital.)

43 Illustrations. 40s.

EXPERIMENTAL TUBERCULOSIS: BACILLUS AND HOST
With Addendum on Leprosy
A Ciba Foundation Symposium.
99 Illustrations. 42s.

GERMAN-ENGLISH MEDICAL DICTIONARY
Containing words currently used in the medical, pharmaceutical and allied professions
Compiled by W. O. GOULDEN, B.A., Dr.Phil.
520 Pages. 45s.

FORENSIC MEDICINE
A Textbook for Students and Practitioners
By Sir SYDNEY SMITH, *C.B.E.*, M.D., F.R.C.P., LL.D., F.R.S.(Ed.), and F. S. FIDDES, *O.B.E.*, M.D.
Tenth Edition. 173 Illustrations. 40s.

HIGH BLOOD PRESSURE
By G. W. PICKERING, M.A., M.B., M.D. (Ghent), F.R.C.P.
106 Illustrations (5 in Colour). 65s.

J. & A. CHURCHILL LTD., 104 GLOUCESTER PLACE, LONDON, W.1

R31
.L3

Syrup Calcidrine REGD

can bring relief to Night Cough

SYRUP CALCIDRINE offers, in a palatable and well-tolerated combination, an effective cough sedative, with distinct antispasmodic properties.

The high iodine content of the product, as represented in calcium iodide, distinguishes it from the usual demulcents and expectorants. By combining the expectorant effect of iodine, the antispasmodic action of Ephedrine and the sedative action of Nembutal, a preparation is obtained which can be utilized to great advantage in the treatment of simple acute and subacute bronchial infections, especially where night cough prevents proper rest and sleep.

Syrup Calcidrine is exceptionally well tolerated since its high iodine content seldom produces any gastric disturbance or untoward effects. The vehicle of syrups of wild cherry and tolu, with aromatics, in which this combination is presented, makes it palatable and excellently suited for patients of all ages.

Each fluid ounce contains:	
Calcium Iodide, B.P.C., 1934	*7 grs.*
Ephedrine Hydrochloride, B.P.	*¼ gr.*
Codeine Sulphate, B.P.C., 1934	*¼ gr.*
Nembutal (Pentobarbitone Sodium B.P.)	*½ gr.*
Alcohol, B.P.	*28 min.*
Syrup of Tolu, B.P.	*36 min.*
Syrup of Wild Cherry	*115 min.*

Syrup Calcidrine REGD.

Average Adult Dose: 1 or 2 teaspoonfuls every 2 to 4 hours until relieved, then at longer intervals.

Abbott

ABBOTT LABORATORIES LIMITED · PERIVALE · GREENFORD · MIDDLESEX

SEPT. 3, 1955 PAGES 463 TO 516

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, PATHOLOGY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 6888 LONDON: SATURDAY, SEPTEMBER 3, 1955 CCLXIX

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

Pulmonary Disease in Relation to Metallic Oxides — K. M. A. PERRY, F.R.C.P.... 463

Epidemiology of Influenza — F. M. DAVENPORT, M.D.; A. V. HENNESSY, M.D.; Prof. C. H. STUART-HARRIS, F.R.C.P.; Prof. T. FRANCIS, jun., M.D. 469

Hæmatogenous Osteitis in the Newborn — W. M. DENNISON, F.R.C.S.E. 474

Anticoagulant Therapy — D. G. FERRIMAN, M.R.C.P.; E. M. R. TILL, M.B..... 476

The "L.E.-Cell" Phenomenon in Active Chronic Viral Hepatitis — R. A. JOSKE, M.R.A.C.P.; W. E. KING, F.R.A.C.P..... 477

Fibrous Dysplasia of the Skull — N. AMELI, F.R.C.S.E..... 480

Oral Iron Compounds — D. J. O'SULLIVAN, M.R.C.P.; P. G. HIGGINS, M.B.; J. F. WILKINSON, F.R.C.P.... 482

Rupture of the Stomach Complicating Gastric Hæmorrhage — D. E. BOLT, F.R.C.S.; W. B. HENNESSY, M.R.C.P... 485

Unilateral Digital-artery Thrombosis — S. H. HARRISON, F.R.C.S.E... 486

NEW INVENTIONS

A Child-size Operating-table — P. P. RICKHAM, F.R.C.S..... 487

PUBLIC HEALTH

Poliomyelitis..... 511

Food-poisoning in Derbyshire... 511

School Camp Closed..... 511

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents... 501

LEADING ARTICLES

BRONCHIECTASIS 489

HODGKIN'S DISEASE..... 490

ANNOTATIONS

Shigella Systematics..... 491

Classification and Site of Lung Cancer 492

Training Nurses at a University 492

Venous Cooling and Rewarming 493

Bone Salt..... 493

SPECIAL ARTICLES

Trends in the Prisons..... 494

THE WIDER WORLD

British North Greenland Expedition 1952–54 — H. E. LEWIS, M.B.; J. P. MASTERTON, M.B..... 494 (*to be concluded*)

LETTERS TO THE EDITOR

Bread (Mr. T. Moran, D.SC.)..... 502

Wholemeal Bread (Dr. C. M. Smith) 502

Bread and Milk (Prof. A. V. Neale, F.R.C.P.)..... 503

Personal Health Services in London (Dr. F. Gray)..... 503

Prevention of Tuberculosis (Dr. F. Langford)..... 503

Homosexuality (Dr. E. K. Pritchard; Dr. John Forbes).. 504

Sequels to Anæsthesia (Dr. P. D. Bedford) 505

Staffing the Transfusion Service (Dr. George Discombe)..... 505

Incomplete Pituitary Insufficiency (Dr. Douglas Hubble)..... 506

The Death Penalty (Mr. Paul Hickinbotham, F.R.C.S.; Dr. C. W. M. Whitty; Dr. F. E. D. Griffiths; Dr. Lise Gellner; Prof. W. Norman Taylor, M.D.) 506

Acute Choreo-athetosis During Reserpine Therapy (Dr. A. Muir) 507

Calcification Within the Liver (Dr. C. D. Alergant)..... 507

Continuous Narcosis (Dr. S. M. Coleman)..... 507

Pseudomonas Infection in a Urological Ward (Mr. E. W. Riches, F.R.C.S.)..... 508

The Ætiology of Rheumatic Fever (Dr. Michael Kelly)..... 508

Mental Effects of Reserpine (Dr. R. W. Watton)..... 508

The Curriculum (Mr. Albert Jacob) 508

Reduction of Overdrafts (Dr. T. D. Blott)..... 509

Isoniazid and Clinical Trials (Dr. P. D'Arcy Hart)..... 509

Unicef (Mr. E. J. R. Heyward).. 509

Memoir of Lord Horder (Lord Horder) 511

REVIEWS

Notices of Books..... 487

OBITUARY

Andrew Topping..... 511

Ernest William Ainley-Walker.. 513

Frederick Alexander Ethelbert Silcock 514

James Bonnell Howell..... 514

Lord Horder..... 514

NOTES AND NEWS

Campaign Against Capital Punishment 515

Hygienic Attachment for Out-patient Couch..... 515

Tropical Hygiene..... 515

Modification of an Infants' Incubator 516

University of London..... 516

University of Louisville, Kentucky 516

Royal Society of Health..... 516

Army Appointment..... 516

International Congress of Internal Medicine 516

International Society of Plastic Surgeons 516

International College of Surgeons 516

Awards in Radiological Research 516

Inquiry into Faulty Poliomyelitis Vaccine 516

Appointments..... 516

MEDICAL STUDENTS AND MEDICAL SCIENCES

Some Problems of Education in Britain and the United States

by D. C. SINCLAIR, *M.A., M.D.*

'This book can be read with considerable profit, much enjoyment, and with many a quiet chuckle, since the author has an attractive style, a dry, even pungent wit, a gift of phrase, and an aptitude for making his points. It can be recommended to all, but especially to those who feel that medical education is a dull subject or one which can look after itself.'—BRITISH MEDICAL JOURNAL.

168 *pages* 25s. *net*

OXFORD UNIVERSITY PRESS

Medical Research Council

Studies on Expenditure of Energy and Consumption of Food by Miners and Clerks, Fife, Scotland, 1952

BY R. C. GARRY, R. PASSMORE, GRACE M. WARNOCK AND J. V. G. A. DURNIN

This report describes the methods used to obtain an accurate record of the food eaten by nineteen underground miners and ten colliery clerks during one week and of each man's calorie expenditure in all his various activities both at work and off-duty over the same period.

Special Report Series No. 289
5s. (by post *5s. 3d.*) **90c.** [by post 95*c.*]

H. M. Stationery Office

P.O. Box No. 569, London, S.E.1; Edinburgh; Manchester; Birmingham; Cardiff; Bristol; Belfast; or through any bookseller; and from British Information Services, 30 Rockefeller Plaza, New York, 20, U.S.A.

NAPT PUBLICATIONS

WHYS AND WHEREFORES IN TUBERCULOSIS

GEORGE DAY, M.A., M.D.

A guide book for patients, their friends and relations—and everyone else.
Three shillings and sixpence

*

BCG AND VOLE VACCINATION

A PRACTICAL HANDBOOK

K. NEVILLE IRVINE, M.A., D.M., B.Ch., M.R.C.S., L.R.C.P.
Adviser in B.C.G. Vaccination to Oxford Regional Hospital Board

FOREWORD BY FREDERICK HEAF, M.A., M.D., F.R.C.P.
David Davies Professor of Tuberculosis
The Welsh National School of Medicine

96 pages, comprehensive index,
10 coloured plates. Clothbound
Twelve shillings and sixpence

*

Order direct from:
NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS
TAVISTOCK HOUSE NORTH, TAVISTOCK SQUARE, LONDON, W.C.1

HENRY KIMPTON'S PUBLICATIONS

New Book — Ready next Month

THE PREGNANCY TOXÆMIAS or THE ENCYMONIC ATELOSITESES

By **G. W. THEOBALD**, M.A., M.D.(Cambridge), F.R.C.S.(Edin.), F.I.C.S., F.R.C.O.G., M.R.C.P.(Lond.)
With a Chapter on the Adrenal Cortex by JOHN DAWSON, M.B., Ch.B., M.Sc.(Leeds)

6" × 10" — xvi + 488 Pages — 56 Illustrations — Cloth — Price **63s.** net

New Book — Just Ready

BONE AND JOINT X-RAY DIAGNOSIS

By **MAX RITVO**, M.D.

7" × 10" — 752 Pages — 568 Illustrations on 398 Engravings — Cloth — Price **£7 5s.** net

New Book — Now Ready

A TEXTBOOK OF NEUROLOGY

By **H. HOUSTON MERRITT**, M.D.

6" × 9½" — 746 Pages — 181 Illustrations and 128 Tables — Cloth — Price **90s.** net

New Book — Now Ready

PATHOLOGY

By **PETER A. HERBUT**, M.D.

7" × 10" — 1227 Pages — 1378 Illustrations on 651 Figures and 6 Coloured Plates — Cloth — Price **£6** net

New Book — Just Ready

SELF-HELP FOR THE ARTHRITIC

A COURSE OF HOME TREATMENT FOR THE COMMONER TYPES OF ARTHRITIS

By **DAVID WHITE**, M.C.S.P.

With a Foreword by G. L. W. BONNEY, M.S.(Lond.), F.R.C.S.(Eng.)

5" × 7½" — 55 Pages — 26 Illustrations — Wrappers — Price **3s. 6d.** net (Postage 3d.)

New (5th) Edition — Just Ready

MANAGEMENT OF OBSTETRIC DIFFICULTIES

By **PAUL TITUS**, M.D.

FIFTH EDITION, REVISED by J. ROBERT WILLSON, M.D., M.S.

6½" × 9½" — 737 Pages — 348 Illustrations and 1 Coloured Plate — Cloth — Price **92s. 6d.** net

25 Bloomsbury Way — **HENRY KIMPTON** — **London, W.C.1**

Medical Book Department of Hirschfeld Brothers Ltd.

LLOYD LUKE

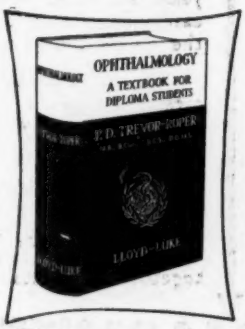
A new book for the postgraduate

OPHTHALMOLOGY

A TEXTBOOK FOR DIPLOMA STUDENTS

by P. D. TREVOR-ROPER

M.B., B.Chir. (Camb.), F.R.C.S., D.O.M.S. (Eng.)
Curator, Dept. of Pathology, Institute of Ophthalmology ;
Asst. Ophthalmic Surgeon, Westminster Hospital.



This textbook aims to cover the field of ophthalmology required by the post-graduate student seeking an ophthalmic diploma. It deals at appropriate length, and in considerable detail, with the anatomy and physiology of the eye, with physical and physiological optics including the prescription of spectacles, and then covers systematically the diseases of the outer and inner eye. The emphasis falls throughout on clinical experience.

xvi + 656 *pp.* 449 *illustrations*, 8 *colour plates* (1955) **75s.** net

A new book for the specialist

STUDIES ON THE CEREBRAL CORTEX

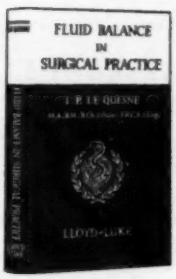
by S. RAMÓN Y CAJAL

(Translation from the Spanish
by Lisbeth M. Kraft, Yale University)

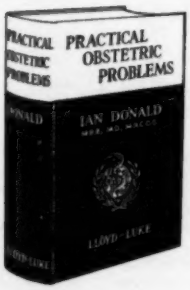
The timeliness of this translation is self-evident from the widespread and growing interest in the limbic system. Nevertheless, a precise knowledge of anatomy is essential to a thorough elucidation of function. When Ramón y Cajal undertook and completed the series of studies included in this volume, he probably gave us the most precise and comprehensive single anatomical account of the limbic system that is available.

xii + 179 *pp.*
108 *illustrations*
(1955) **27s. 6d. net**
(*Ready October*)

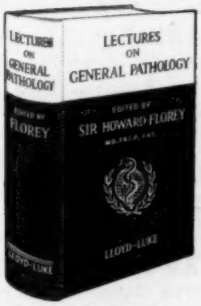
Other LLOYD-LUKE publications



FLUID BALANCE IN SURGICAL PRACTICE
by L. P. LE QUESNE
B.M., B.Ch. (Oxon.), F.R.C.S. (Eng.)
Assistant Director, Dept. of Surgical Studies, Middlesex Hospital.
viii + 130 *pp.*
41 *illustrations.* (1954) **17s. 6d.** net



PRACTICAL OBSTETRIC PROBLEMS
by IAN DONALD
M.B.E., M.D. (Lond.), F.R.C.O.G.
Regius Professor of Midwifery, University of Glasgow.
xii + 578 *pp.* 115 *illustrations.* (1955) **45s.** net



LECTURES ON GENERAL PATHOLOGY
Edited by SIR HOWARD FLOREY
M.D., F.R.C.P., F.R.S.
Professor of Pathology, University of Oxford
xiv + 734 *pp.* 344 *illustrations*, 4 *colour plates*
(1954) **63s.** net

Descriptive leaflets available on request

LLOYD-LUKE (MEDICAL BOOKS) LTD., 49 NEWMAN ST., W.1.

Easily Administered

Where there is a suspected deficiency of the vitamins of the B_2 group, Marmite yeast extract is often recommended as it is easily administered and can be included in the normal diet in many different ways.

Its use in special diets is also often advocated, particularly in those diets where the nutrients normally supplying the B vitamins are deficient.

Marmite supplies riboflavin (1.5 mg. per oz.), nicotinic acid (16.5 mg. per oz.), folic acid, pantothenic acid, pyridoxin, biotin, choline, inositol and *p*-aminobenzoic acid together in a palatable form.

MARMITE

yeast extract

Literature on request

Obtainable from Chemists and Grocers

Special terms for packs for hospitals, welfare centres and schools

MARMITE LIMITED

35, Seething Lane, London, E.C.3

8309

ASTHMA

Instant relief!

Ever increasing numbers of medical men are relying on Rybarvin Inhalant to combat bronchospasm. The Ministry of Health having agreed to the prices of Rybar asthma inhalants, Rybarvin can be freely prescribed.

RYBARVIN brings relief. Consistently, often spectacularly, attacks are cut short and their frequency lessened. Free from excess acid, non-irritant and non-habit-forming it is an ideal inhalant for all asthmatics young and old.

Formula	
Pituitary Extract. Posterior and Anterior Lobe	0·40% w/v
Methylatropine Nitrate	0·14% w/v
Papaverine	0·08% w/v
Adrenaline	0·40% w/v
Ethyl Para-aminobenzoate	0·20% w/v
Iso-butyl Para-aminobenzoate	0·01% w/v

RYBAR INHALER has been specially designed for aerosol therapy. Both Rybarvin and the Inhaler may be prescribed on N.H.S. Form E.C.10.

Samples and details of trial outfits forwarded on request.

RYBAR

LABORATORIES LTD.

TANKERTON · KENT

Again the price of I.C.I. penicillin is reduced, and the most useful and the least toxic of the antibiotics costs still less. The basic cost to the Health Service for 1 mega unit of crystalline penicillin G is now only 1/4d.

From the surge of claims made for newer and better antibiotics, it is easy to lose one's perspective and forget the plain fact that penicillin continues to be the antibiotic of choice for all Gram-positive infections due to staphylococci, hæmolytic streptococci & pneumococci and for all cases of gonorrhœa and syphilis.

PRICE REDUCTIONS AFFECT

all 'Avlon' brand crystalline penicillin G salts, 'Penavlon' Tablets and all formulations of 'AVLOPROCIL' brand Procaine Penicillin for Injection.

Full details are available from

IMPERIAL CHEMICAL (PHARMACEUTICALS) LTD.

WILMSLOW **MANCHESTER**

A subsidiary company of Imperial Chemical Industries Limited

Ph. 485/1

SERENITY

in the menopause . . .

MIXOGEN tablets, by correcting endocrine imbalance, rapidly relieve the emotional disturbance of the menopause.

MIXOGEN

OESTROGEN-ANDROGEN SYNERGY

dosage **:** 1-2 tablets daily, reducing when possible.

Each tablet contains 0.0044 mg. of crystalline ethinyloestradiol B.P. and 3.6 mg. of crystalline methyltestosterone B.P. Tubes of 25 and bottles of 100.

Literature and sample on request.

ORGANON LABORATORIES LIMITED

BRETTENHAM HOUSE · LANCASTER PLACE · LONDON · W.C.2

Telephone : TEMple Bar 6785/6/7 0251,2 Telegrams : Menformon, Rand, London.

A New M.M.P. Product

EFFECTIVE NON-BARBITURATE SEDATION

NOCTYNOL

NON-BARBITURATE TABLETS

★ Each tablet contains :

Mephenesin	200 mg.
Carbromal	200 mg.
Bromvaletone	70 mg.
Ascorbic Acid	30 mg.

Available in bottles of 50 tablets.

Prescribable on N.H.S. Form E.C.10.

Professional Sample and Literature gladly available on request.

Growing recognition of the long-term cumulative toxic effects of barbiturates, and the well-known, insidious, psychic habituation to their use—matters of considerable concern to many Doctors—are now avoidable dangers through the formulation of Noctynol Tablets. The latter present :

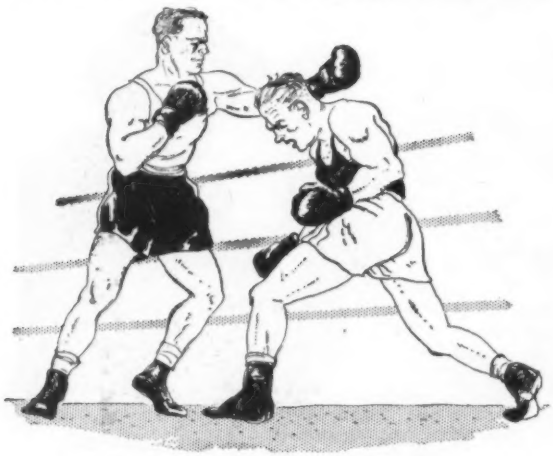
MEPHENESIN, which, by diminishing reflex hyperexcitability, relieving nervous tension and anxiety, and promoting muscular relaxation, not only induces the composure essential to the onset of sleep, but also ensures that the sleep is restful and refreshing.

CARBROMAL and BROMVALETONE which, by synergism, act as effective hypnotics and quickly transform the mephenesin-induced sedation to hypnosis. Unlike the barbiturates, carbromal and bromvaletone are non-toxic and non-cumulative and, as elimination is comparatively rapid, they rarely give rise to 'hangover' and depression.

In smaller doses, NOCTYNOL Tablets act as a non-depressant calmative eminently suitable for daytime sedation.

MOORE MEDICINAL PRODUCTS LTD.

1, QUEEN'S TERRACE, ABERDEEN • 64, GLOUCESTER PLACE, LONDON, W.1



'ALGIPAN' Balm

TRADE MARK

Wyeth

Unfortunately, the pursuit of the noble art is unthinkable amongst those with even the mildest rheumatic distress. But to the uncounted thousands who suffer from recurrent 'fibrositis,' ALGIPAN Balm provides the counter-cross to pain. The in-fighting qualities of *histamine* and *methyl nicotinate* ensure penetration well below the skin, inducing an immediate capillary and arteriolar dilatation which adroitly sidestep the lunges of muscular rheumatism.
ALGIPAN is available in 40 G. tubes.

JOHN WYETH & BROTHER LIMITED, Clifton House, Euston Road, London, N.W.1

POSALFILIN

(*Podophyllin-Salicylic Acid Compound*)

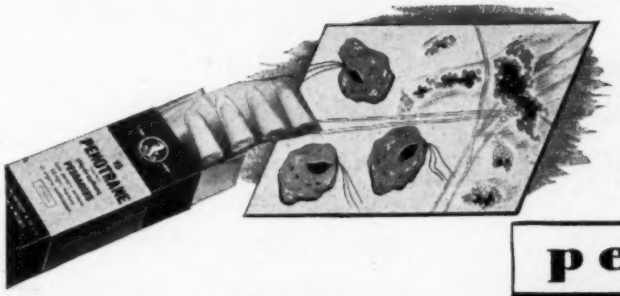
Treatment of

PLANTAR WARTS
VENEREAL WARTS
SEBORRHOEIC WARTS
WARTS ON HANDS

OINTMENT

PACKED IN ½ OZ. TUBES
Prescribable on Form E.C. 10
Further details on request

CAMDEN CHEMICAL CO. LTD.
61 GRAY'S INN ROAD · LONDON, W.C.1



Effective against both Trichomonas and Monilia

penotrane

PHENYLMERCURIC DINAPHTHYLMETHANE DISULPHONATE

in vaginal therapy

The powerful trichomonacidal and fungicidal properties of PENOTRANE present the greatest advantage in the treatment of vaginal discharge, particularly trichomonal vaginitis and moniliasis. PENOTRANE is also strongly bactericidal and it deeply penetrates the vaginal mucosa. Both the Pessaries and Vaginal Cream are buffered to approximate the normal vaginal acidity.

INDICATIONS: ★ Vaginal Discharge due to trichomonal, monilial and coccal infections. ★ Pruritus Vulvae. ★ Obstetrical Lubrication. ★ Pre-operative Skin Disinfection.

Literature and professional samples on request.

AVAILABILITY:

PENOTRANE	Applicator Sets—containing Penotrane Vaginal Cream & disposable applicators.
PENOTRANE	Aqueous Solution—Bottles of 100, 500 and 2,000 c.c.
PENOTRANE	Jelly—Tubes of 1 oz.
PENOTRANE	Pessaries—Cartons of 15 and 100.
PENOTRANE	Powder — Polythene Insufflating Containers.
PENOTRANE	Tincture—Bottles of 15, 100, 500 and 2,000 c.c.

WARD, BLENKINSOP & COMPANY, LIMITED

6 HENRIETTA PLACE — LONDON — W.1

Telephone: LANgham 3185. Telegrams: Duochem, Wesdo, London.

AMFAC GLANULES

(ANTI-MENORRHAGIC FACTOR)

FOR FUNCTIONAL UTERINE HAEMORRHAGE

Bottles of 25, 50 & 100

Write for literature to :—

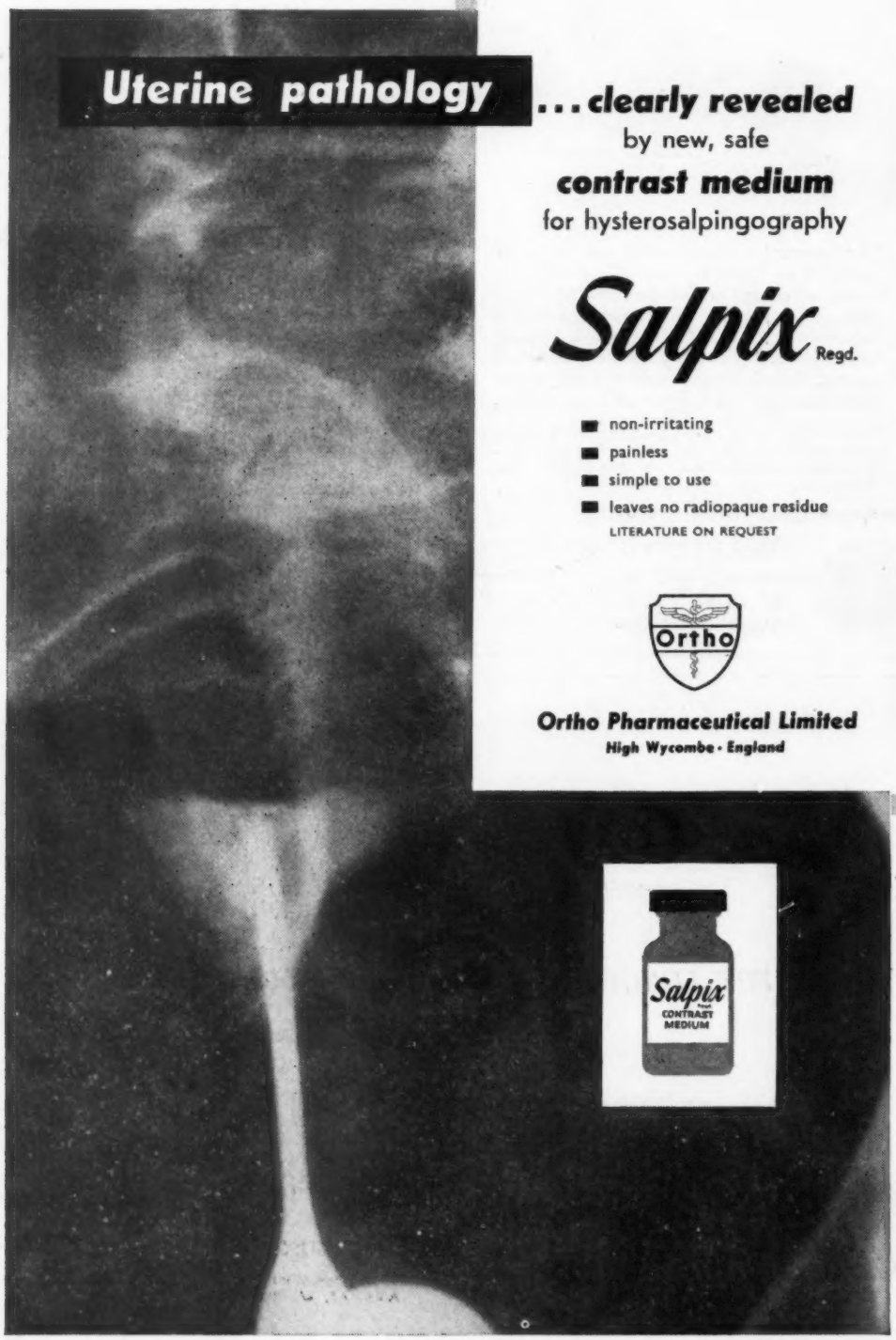
THE ARMOUR LABORATORIES

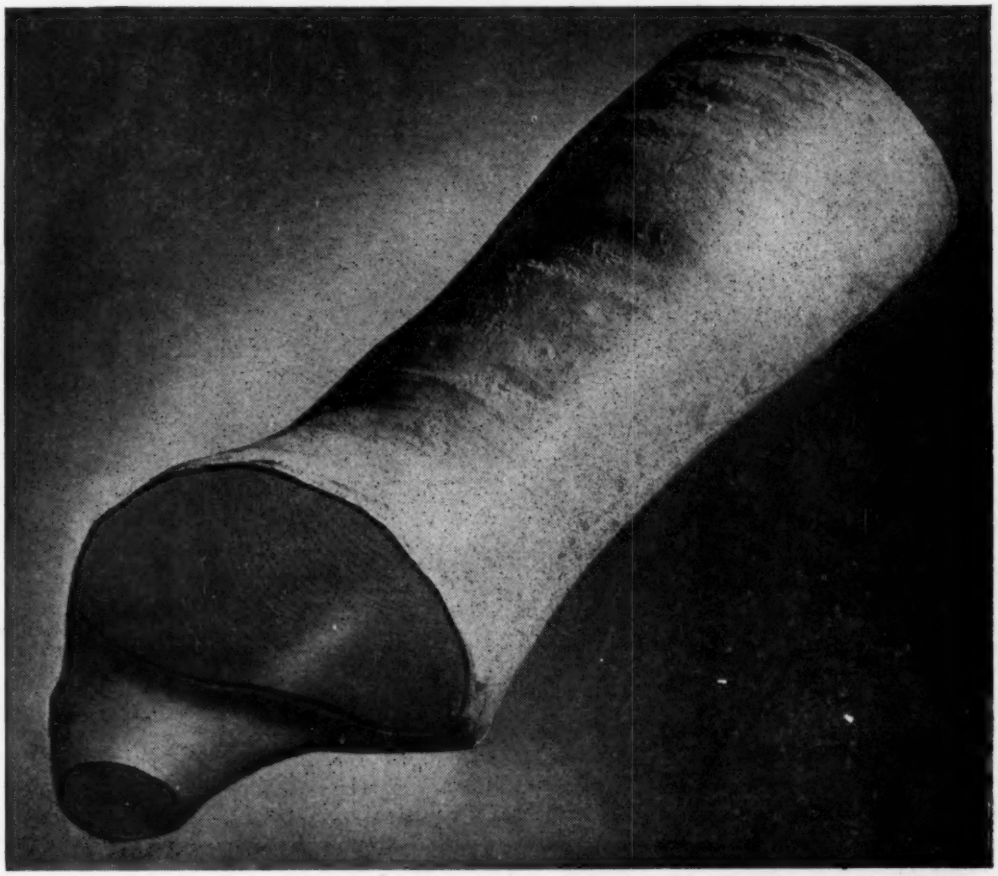
(ARMOUR & COMPANY LTD.)

HAMPDEN PARK, EASTBOURNE, SUSSEX

Telephone: HAMPDEN PARK 740

Telegrams: ARMOLAB, EASTBOURNE


Uterine pathology
...clearly revealed
by new, safe
contrast medium
for hysterosalpingography
Salpix Regd.
non-irritating
painless
simple to use
leaves no radiopaque residue
LITERATURE ON REQUEST
Ortho
Ortho Pharmaceutical Limited
High Wycombe · England
Salpix
CONTRAST MEDIUM



Perfect Cast–*after 3 weeks' hard wear!*

THE BANK MANAGER of a small Essex town, fell and suffered a Colles fracture. Here is the Gypsona cast which was removed three weeks later. The thin, even formation is a characteristic of a Gypsona cast. This thin, light cast is made possible by the high plaster content of Gypsona which gives exceptional strength and makes it the most economical plaster of Paris bandage.

The clean, porcelain-like appearance of the cast, still intact after three weeks' wear, is further evidence of the quality of the fine ground Gypsum and the high plaster content of this remarkable bandage.

Gypsona
TRADE MARK
PLASTER OF PARIS BANDAGES

Gypsona bandages are made by Smith & Nephew Ltd., Welwyn Garden City, Herts.

Towards meeting the demands of growth

THE higher metabolic needs of the young which accompany natural growth and development and which are further increased by heavy daily expenditure of energy, tend to diminish reserves of physical and nervous vitality.

'OVALTINE' provides a useful supplement to help to satisfy the extra needs for proximate and accessory food principles. The malt, milk, cocoa, soya and eggs which 'Ovaltine' contains are blended to form a highly nutritious food beverage —deliciously flavoured and easily assimilated.

IT is of value in helping to maintain normal weight increase and is of undoubted help to those recovering from the debilitating effects of the common fevers of childhood.

FOR growing children 'Ovaltine' is a dietary reinforcement which can be routinely recommended with confidence.

OVALTINE

Vitamin Standardization per oz.—Vitamin B_1, 0.3 mg.; Vitamin D, 350 i.u.; Niacin, 2 mg.

A. WANDER LIMITED, 42 Upper Grosvenor Street, London W.1.

Manufactory, Farms and 'Ovaltine' Research Laboratories: King's Langley, Herts.

M.384

The World Over

India...

The scientific, cultural and commercial organization of a Pharmaceutical House with more than a century of experience assures Physicians and Scientists of an ever prompt and efficient co-operation in the eternal struggle for the health of Mankind.

CARLO ERBA MILANO

ESTABLISHED: 1853

Unique in the field

Relief of pain

Inhibition of Hypermotility

Relief of spasm

and FREEDOM FROM SIDE EFFECTS

the new spasmolytic

BUSCOPAN

HYOSCINE-N-BUTYLBROMIDE Regd

FOR ORAL AND PARENTERAL THERAPY

ampoules of 0.02 Gm. • tablets of 0.01 Gm.

Manufactured in England by PFIZER CORPORATION as registered user for
C. H. BOEHRINGER SOHN · INGELHEIM AM RHEIN
(Registered Proprietors of the Trade Mark.)
Distributed by PFIZER LIMITED · FOLKESTONE

12

Effective diuretic therapy by oral administration is now made possible by MERCLORAN. One emplet three times daily, equivalent to 30 mg. mercury, is usually sufficient to keep cardiac patients free from oedema. Where more intensive treatment is needed MERCLORAN, being well tolerated by the majority of patients, can be taken more often and in increased doses. The need for injection is thus frequently eliminated.

In severe cases, it is often desirable to initiate *treatment parenterally, in which case the chemically related compound MERCARDAN (meralluride Sodium U.S.P.) is available.*

MERCLORAN

(CHLORMERODRIN N.N.R.)

IN BOTTLES OF 25 AND 250 EMPLETS
(Enteric coated tablets)
AND MERCARDAN FOR PARENTERAL USE

PARKE, DAVIS & COMPANY, LIMITED *(Inc. U.S.A.)* HOUNSLOW, MIDDLESEX. Telephone: Hounslow 2361
570

EURAX
REGD. TRADE MARK
ANTIPRURITIC

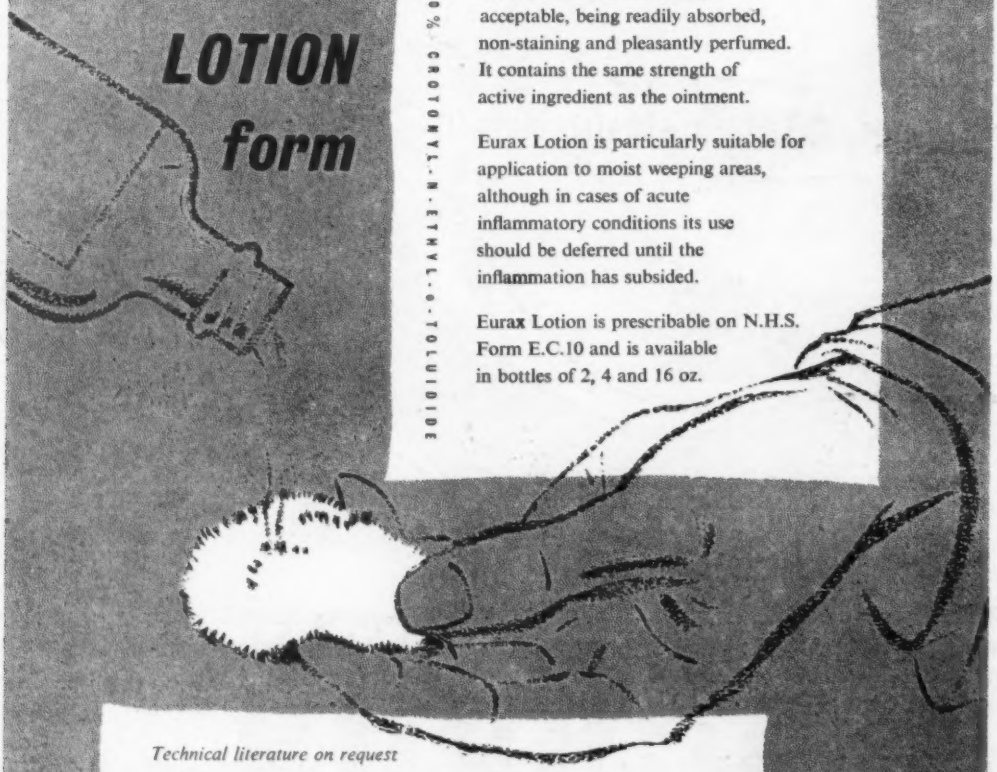
CONTAINING 10% CROTONYL-N-ETHYL-O-TOLUIDE

now also in LOTION form

Eurax has been used in the treatment of many cases of pruritus with marked success. Relief is usually prompt and long-lasting. It is now available as a soothing, emollient lotion, which is cosmetically acceptable, being readily absorbed, non-staining and pleasantly perfumed. It contains the same strength of active ingredient as the ointment.

Eurax Lotion is particularly suitable for application to moist weeping areas, although in cases of acute inflammatory conditions its use should be deferred until the inflammation has subsided.

Eurax Lotion is prescribable on N.H.S. Form E.C.10 and is available in bottles of 2, 4 and 16 oz.



Technical literature on request

GEIGY PHARMACEUTICAL COMPANY LTD.

Rhodes, Middleton, MANCHESTER

Geigy

EASILY ASSIMILATED IRON

For hypochromic anaemia in all ages and conditions, particularly in pregnancy, childhood, adolescence and advancing age, Ferraplex B provides easily assimilated iron supplemented, for maximum haematinic effect, with copper, vitamin C and complete vitamin B complex. Side effects such as gastro-intestinal disturbances are rare.

Available in bottles of 50 and 250 tablets.
Basic N.H.S. cost of 250 tablets, 15/6d.
Average daily cost of treatment, 4½d.

The recommended daily dose of six FERRAPLEX B *tablets contains:—*

Ferrous sulphate exsicc., B.P.	1 gramme
Copper carbonate	2 mg.
Ascorbic acid (Vitamin C)	50 mg.
Natural vitamin B complex extract *prepared from Brewers' Yeast and including*	2 grammes
Aneurine hydrochloride	3 mg.
Riboflavine	6 mg.
Nicotinamide	30 mg.

and pantothenic acid, pyridoxine, folic acid, choline, inositol, biotin, para-aminobenzoic acid and other naturally occurring factors of the vitamin B complex.

FERRAPLEX B

BENCARD

C. L. BENCARD LTD.
PARK ROYAL · LONDON · N.W.10
Telephone: ELGar 6681.
Telegrams: Bencarlond, Harles, London.

The safe

anticholinergic agent

for

Peptic Ulceration

A large number of cases of peptic ulceration have been successfully treated with "Pro-Banthine". By its anticholinergic action inhibiting transmission of neural stimuli at both sympathetic and parasympathetic ganglia and at parasympathetic myoneural junctions, hypermotility of the stomach and duodenum is reduced. This results in rapid relief of pain. "Pro-Banthine" is easily administered, orally. It has few side-effects, which are all readily eliminated by adjustment of dosage.

"Pro-Banthine" is safe, easily administered, and devoid of unpleasant taste. In most cases, oral treatment with "Pro-Banthine" gives considerable relief of ulcer pain, and there is marked improvement in the patient's condition 48 to 72 hours after commencing treatment. Dosage is usually 15 or 30 mg. (1 or 2 tablets) four times daily. "Pro-Banthine" is available in bottles of 40, 100 and 1,000 tablets, each tablet containing 15 mg. of Propantheline Bromide.

Literature on request

*REGISTERED TRADE MARK

SEARLE

Ethical Pharmaceuticals since 1888

G.D. SEARLE & CO., LTD.

17, Manchester Street
London, W.1.

Telephone: Welbeck 1306.

Veracolate is indicated in chronic cholecystitis, for the "bilious attack" and in constipation. It is a cherry-red tablet containing bile salts which encourage the production of normal bile. It also helps to keep the bile freely flowing, and has laxatives added to correct the constipation so often accompanying biliary stasis.

ACTIVE CONSTITUENTS: *Sodium taurocholate and sodium glycocholate, each 1.67 gr., ext. cascara sagrada 1.00 gr., phenolphthalein 0.50 gr., oleoresin capsicum 0.04 gr.*

PACKING: *Bottles 50 & 100 tablets; bottles of 500 for dispensing purposes only supplied at 15/-, exempt from Purchase Tax on prescription.*

Veracolate

No Warner preparation has ever been advertised to the public.

WILLIAM R. WARNER & CO. LTD., Power Road, London, W.4.

smoothing the way ahead

Through the years of childhood and beyond, MILONTIN* brings powerful anti-convulsant action to sufferers from *petit-mal*. Milontin has been shown to reduce considerably the frequency of attacks in the majority of cases and to completely control them in many. An associated improvement in both mental and physical activity is often seen. In use, it is rapidly absorbed, well tolerated and relatively non-toxic.

A product of the PARKE-DAVIS Research Laboratories, MILONTIN is being recognised as one of the most effective anti-convulsants for the treatment of petit-mal epilepsy.

Milontin

for Petit-mal Epilepsy

**Trade Mark*

Milontin Capsules, 0·5 g. each, in bottles of 50 and 500.

PARKE, DAVIS & COMPANY LIMITED *(Inc. U.S.A.)* Hounslow, Middlesex. *Tel: Hounslow 2361*

630

. . . but the human CAN'T hibernate

No winter respite for the human kind . . . no carefully garnered nourishment. How important it is, then, to pay *special* attention to adequate intake of nutritional factors during the rigorous months ahead . . .

Vi-Magna* MULTIVITAMINS

Individuals who feel "out of sorts" often benefit from a course of Vi-Magna Capsules. In such cases, one capsule a day does much to improve appetite and general well-being.

Each capsule contains: Vitamin A, 5000 I.U.; Vitamin D, 500 I.U.; Thiamine HCl B_1), 3.0 mg.; Riboflavine (B_2), 3.0 mg.; Pyridoxine HCl (B_6), 0.2 mg.; Ascorbic Acid (C), 75.0 mg.; Niacinamide, 20.0 mg.; Calcium Pantothenate, 1.0 mg.; FOLVITE* Folic Acid, 1.0 mg.; Vitamin B_{12}, 1 microgram. *Bottles of* 100 *and* 1,000.

Gevral* GERIATRIC VITAMIN MINERAL SUPPLEMENT

A truly valuable combination of vitamins and minerals, for those past middle life.

Each capsule contains: Vitamin A, 5000 I.U.; Vitamin D, 500 I.U.; Vitamin B_{12}, 1 microgram; Thiamine Hydrochloride (B_1), 5 mg.; Riboflavine (B_2), 5 mg.; Niacinamide 15 mg.; Folic Acid, 1 mg.; Pyridoxine Hydrochloride (B_6), 0.5 mg.; Calcium Pantothenate, 5 mg.; Choline Dihydrogen Citrate, 100 mg.; Inositol, 50 mg.; Ascorbic Acid (C), 50 mg.; Vitamin E, 10 units; Rutin, 25 mg.; Iron (as $FeSO_4$), 10 mg.; Iodine (as KI), 0.5 mg.; Calcium (as $CaHPO_4$), 145 mg.; Phosphorus (as $CaHPO_4$), 110 mg.; Boron (as $Na_2B_4O_7 \cdot 10H_2O$), 0.1 mg.; Copper (as CuO), 1 mg.; Fluorine (as CaF_2), 0.1 mg.; Manganese (as MnO_2), 1 mg.; Magnesium (as MgO), 1 mg.; Potassium (as K_2SO_4), 5 mg.; Zinc (as ZnO), 0.5 mg. *Bottles of* 30.

Lederplex* VITAMIN B COMPLEX LIQUID

Contains the entire B complex from liver—plus other important nutritional factors. It does much to ensure normal cell life and growth, and promotes resistance to infection. Lederplex is also issued in Capsules and Tablets.

Each teaspoonful of Lederplex Liquid contains: Thiamine HCl, 2.0 mg.; Riboflavine, 2.0 mg.; Niacinamide, 10.0 mg.; Pyridoxine, 0.2 mg.; Pantothenic Acid, 2.0 mg.; Choline, 20.0 mg.; Inositol, 10.0 mg.; FOLVITE* Folic Acid, 0.2 mg.; Soluble Liver Fraction, 470.0 mg.; Vitamin B_{12}, 5 micrograms. *Bottles of* 4, 8 *and* 12 *fl. oz.*

* Regd. Trade-Mark

Lederle

LEDERLE LABORATORIES DIVISION

Cyanamid Products Ltd. BUSH HOUSE, LONDON, W.C.2. TEMPLE BAR 5411

NOBECUTANE *the sterile plastic wound dressing* (*Brit. med. J.* 1954.2.17)

NOW ALSO AVAILABLE IN SPRAY CONTAINERS

NOBECUTANE consists of an acrylic resin dissolved in a mixture of acetic esters. When applied to the dry skin the solvent evaporates leaving an elastic, transparent, and adhesive film.

NOBECUTANE has many advantages over conventional dressings. It is non-irritating, transparent, tough, pliable and durable and can be applied over joints where some degree of mobility is required.

NOBECUTANE is impervious to bacteria but permeable to air and water vapour and allows normal aqueous exhalation of the skin to escape. No maceration of the skin occurs.

NOBECUTANE is economical in use and results in a saving of at least 20% over the cost of conventional dressings. In addition it is welcomed by nursing staff who find it effects a considerable saving in time.

NOBECUTANE is available in 300 ml. spray containers, holding sufficient solution to dress 60-70 surgical wounds. It is also available in bottles of 50 ml. and 250 ml.

Packed and issued by the sole distributors

EVANS MEDICAL **EVANS MEDICAL SUPPLIES LIMITED,** LIVERPOOL & LONDON

552A

IMPORTANT ANNOUNCEMENT

Penicillin & Streptomycin 'Viules'

Now fully aspirating

Both Pro-Stabillin A.S. and Streptomycin viules are now fitted with special plungers which enable aspiration to be carried out prior to injection. (Full details gladly sent on request).

Now reduced in price

This technical advance coincides with a reduction in price for both these viules—the new prices being effective from *September 5th.*

Price reductions are also announced for other Boots penicillin salts

Literature and further information on request

BOOTS PURE DRUG COMPANY LIMITED, NOTTINGHAM

Boots

5218

Improved intragastric therapy

WHENEVER WHOLE PROTEIN cannot be ingested, digested, absorbed or utilised, Casydrol (Oral)—predigested protein—may well speed recovery and hence discharge from hospital.

CASYDROL (ORAL) is half amino-acids and polypeptides and half lactose—the lactose helps to meet the caloric needs of the patient and spares the protein for tissue regeneration. Casydrol (Oral) is ideally suitable for administration by intragastric drip and is an advance on milk drip therapy.

CASYDROL (ORAL) *is classified in Category* I *and may be prescribed under the National Health Service.*

Casydrol

ORAL

A

BENGER

PRODUCT

BENGER LABORATORIES LIMITED · HOLMES CHAPEL · CHESHIRE

After September 3rd

Prescriptions for 30 Glaxo antibiotic and pharmaceutical preparations will cost less *

These include:

CRYSTAPEN (soluble penicillin Glaxo)

STREPOLIN (stable solution of streptomycin Glaxo)

CYTAMEN (the first British vitamin B_{12})

CRYSTAMYCIN (combined penicillin and streptomycin)

These reductions are in keeping with the long established Glaxo practice of passing on any savings achieved by the development of new and less costly methods of manufacture

** In U.K. and Eire only*

Full details of these price reductions are in the post

GLAXO

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX. BYRon 3434

ETHICAL PHARMACEUTICALS
by VISTER VISMARA TERAPEUTICI

Casatenovo (Como) - Italy

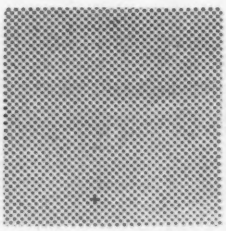
Original manufacture of natural hormones
synthetic hormones, chemotherapeutic substances

Careful standardisation of active ingredients during manufacture, control and investigations in its Research Laboratories

Vister presents

ANTEMOVIS

an entirely new preparation for the control of bleeding in medical and surgical conditions



Double sulphate of 5 - hydroxytryptamine and creatinine 5 mg. in 2 c.c. ampoules - Box of 5.

VISTER

THE DISTILLERS COMPANY

(Biochemicals) Limited

reduce the price of

PENICILLIN and STREPTOMYCIN

still further

from 5th September

With such useful and widely-prescribed drugs as penicillin and streptomycin this continued fall in cost represents a very significant saving to the National Health Service.

Full details of the new price reductions, which also apply to the 'DISTAQUAINE' range of preparations and to 'STREPTAQUAINE', are available from your pharmacist.

'DISTIVIT' B_{12} *is also reduced in price. Full details are available from your pharmacist.*

Distributed by

ALLEN & HANBURYS LTD • BRITISH DRUG HOUSES LTD.
BURROUGHS WELLCOME & CO • EVANS MEDICAL SUPPLIES LTD.
IMPERIAL CHEMICAL (PHARMACEUTICALS) LTD.
PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD.

THE DISTILLERS COMPANY (BIOCHEMICALS) LIMITED
DEVONSHIRE HOUSE, PICCADILLY, LONDON, W.1

41/55

The key to successful peptic ulcer treatment

NULACIN

Nulacin effectively controls gastric acidity. The value of Nulacin in the treatment of peptic ulcer and the prevention of relapse has been confirmed by clinical studies in Great Britain, Australia, the U.S.A. and India. Nulacin tablets are palatable and convenient.

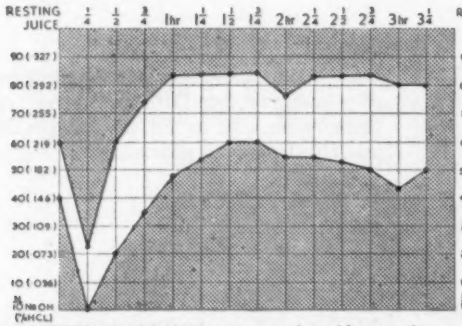
INDICATIONS

Nulacin tablets are indicated whenever neutralization of the gastric contents is required: in active and quiescent peptic ulcer, gastritis, gastric hyperacidity.

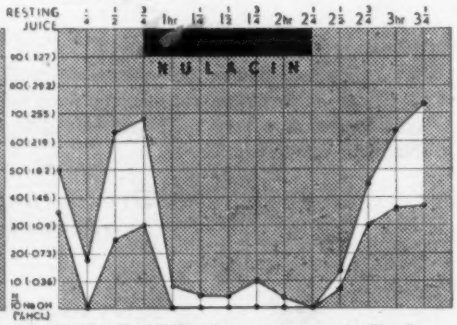
Beginning half an hour after food, a **Nulacin** tablet should be placed in the mouth and allowed to dissolve slowly. During the stage of ulcer activity, up to three tablets an hour may be required. For follow-up treatment, the suggested dosage is one or two tablets between meals.

Nulacin tablets are not advertised to the public, have no B.P. equivalent and may be prescribed on E.C.10. The dispensing pack of 25 tablets is free of Purchase Tax. (Price to pharmacists is 2/-.) Also available in tubes of 12.

Nulacin tablets are prepared from whole milk combined with dextrins and maltose, and incorporate Magnesium Trisilicate 3.5 grs.; Magnesium Oxide 2.0 grs.; Calcium Carbonate 2.0 grs.; Magnesium Carbonate 0.5 grs.; Ol. Menth. Pip. q.s.



GASTRIC ANALYSIS *Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer.*



GASTRIC ANALYSIS *Same patients as in Fig. 1, two days later, showing the striking neutralizing effect of sucking Nulacin tablets (3 an hour). Note the return of acidity when Nulacin is discontinued.*

BIBLIOGRAPHY

The Control of Gastric Acidity. *Brit. Med. J.* 26th July 1952 2 180-182
Medical Treatment of Peptic Ulcer. *Med. Press* 27th February 1952 **227** 195-199
Notes on Remedial Agents. *Med. Rev.* September 1952 **46** 162
Discussion on Peptic Ulceration. *Proc. Roy. Soc. Med.* May 1953 **46** 354
The Effect on Gastric Acidity of "Nulacin" Tablets. *Med. J. Aust.* 28th November 1953 2 823-824
Control of Gastric Acidity by a New Way of Antacid Administration. *J. Lab. Clin. Med.* 1953 **42** 955
Further Studies on the Reduction of Gastric Acidity *Brit. Med. J.* 23rd January 1954 1 183-184
Clinical Investigation into the Action of Antacids. *The Practitioner* July 1954 **173** 46
Management of Peptic Ulceration in General Practice. *Med. World* December 1954 **81** 591-601
Ambulatory Continuous Drip Method in the treatment of Peptic Ulcer. *Amer. Jour. Dig. Dis.* March 1955 **22** 67-71.

Nulacin is available throughout the British Commonwealth, in the U.S.A., and many other countries. It is known as **Nulactin** in Canada and Sweden.

HORLICKS LIMITED
Pharmaceutical Division
Slough, Bucks.

Free to breathe again . . most cases of bronchial asthma respond excellently to 'Neo-Epinine'. More effective than adrenaline as a bronchodilator, it has the further advantage that it is relatively free from side-effects.

Rapid relief follows the oral inhalation of 'Neo-Epinine' No. 1 Spray Solution, a one per cent preparation of isoprenaline sulphate. 'Neo-Epinine' sublingual products, 20 mgm., act within 5–10 minutes. For the more stubborn case, 'Neo-Epinine' No. 2 Spray Solution is advised because it has a more powerful and sustained effect; this product contains 1 per cent of isoprenaline sulphate, 2 per cent of papaverine hydrochloride and 0·2 per cent of atropine methonitrate.

'NEO-EPININE' BRAND ***in asthma***

ISOPRENALINE SULPHATE

BURROUGHS WELLCOME & CO., LONDON

(THE WELLCOME FOUNDATION LTD.)

summer hazards

The warmer months of the year provide conditions suitable for the multiplication of bacteria on contaminated food and for the spread of contamination by flies; it is then that epidemics of bacterial food poisoning, bacillary dysentery and summer diarrhœa of infants are most frequent and widespread.

The organisms commonly responsible for such epidemics are sensitive to the combined action of streptomycin and sulphaguanidine.

The use of Guanimycin will rapidly eliminate the infecting organism and reduce the number of convalescent carriers.

GUANIMYCIN

Oral streptomycin sulphate with sulphaguanidine

In bottles to prepare 4 fluid ounces.

Literature on application.

ALLEN & HANBURYS LTD · LONDON · E·2

TELEPHONE: BISHOPSGATE 3201 (20 LINES). TELEGRAMS: GREENBURYS, BETH, LONDON

PULMONARY DISEASE IN RELATION TO METALLIC OXIDES*

KENNETH M. A. PERRY
M.A., M.D. Camb., F.R.C.P.
PHYSICIAN TO THE LONDON AND ROYAL MASONIC HOSPITALS; VISITING PHYSICIAN, PAPWORTH VILLAGE SETTLEMENT

OF the toxic substances to which workers are exposed by their occupation a few enter the body through the skin, and fewer still through the alimentary canal but most do so through the respiratory tract. I propose, therefore, to consider diseases which develop in the lung as a result of inhalation. It is important to get these diseases in the right perspective: in England and Wales in 1953 only 1033 people died from fibrosis of the lung of occupational origin, compared with 15,128 (343 per million of population) from carcinoma of the lung and 7911 (179 per million) from pulmonary tuberculosis. Mortality-rates, however, do not accurately reflect the importance of occupational diseases: though the fatal cases may be few, knowledge of the hazards may enable much ill health to be prevented.

In industry new substances are continually being used. When one of these substances is toxic to the workers, those first affected may go to many different hospitals, and thus no individual doctor may see the whole picture. Hence it is only by constant alertness, and awareness of the possibilities, that a new occupational disease will be detected and preventive measures will be put into operation before large numbers of people are harmed. The difficulty is all the greater because occupational diseases can mimic every other kind of pulmonary disease.

This lecture is devoted to the metallic oxides, because so many of the rarer metals are coming into industrial use. But I propose to say very little about silicosis caused by silicon dioxide, because so much has already been said about it.

Inert Dusts

Since radiography of the chest became a satisfactory procedure twenty-five years ago, it has been a great help in the diagnosis of most lung diseases. If, as dust, the oxides of metals are inhaled into the lung and remain in its lymphatics they will throw X-ray shadows, the density of which varies with the atomic weight of the metal. Metals such as calcium (atomic weight 40·08) which is found in industries using limestone, marble, lime, cement, and gypsum, produce little radiological shadowing, at most a little arborescence.

Some dusts are dissolved and are excreted by kidney or intestine, but others remain and cause shadowing. Though they may be inert and may not give rise to any fibrosis, we must suppose that they do to some extent interfere with elasticity. Indeed it seems possible that any dust, no matter how innocuous in low concentration, will in large enough quantity eventually overwhelm the defences of the lung and impair function by the sheer accumulation of inert foreign material. It is doubtful whether any worker does in fact ever absorb enough dust to render his lungs non-elastic: and we know that a man can have much opacity in his lung yet live to old age without symptoms. Nevertheless there is every reason to attempt to keep the air of our factories and towns as clean as possible.

BARATOSIS

Barium has an atomic weight of 137·4. Exposure to barium peroxide occurs in the manufacture of paints and lacquers, fireworks, dyes and inks, depilatories, insecticides and rat poisons, glass, and linoleum, and in the rubber industry. Exposure to the dust in association with silica occurs during mining. It produces the densest nodular lung shadows yet recorded. Arrigoni (1933), Pendergrass (1938), and Preti and Talini (1939) have shown that inhalation of barium oxide will produce extensive radiological changes, and Pendergrass and Greening (1934) described the case of a man who had worked for twenty years in the grinding department of a lithopone plant, inhaling dust which was 97% barium sulphate.

Barium peroxide is not widely used in industry, and therefore few radiological changes have been described arising from it. It has, however, been used as a base for the 'Pitressin' snuff used in treating diabetes insipidus and has in this way given rise to X-ray opacities in the lungs.

SIDEROSIS

Exposure to iron dust and fumes is common in industry. It occurs in welders, oxyacetylene cutters, polishers, tool makers, cutlery makers, foundry workers, and hæmatite miners. The last two occupations involve exposure to iron dust and fume associated with silica, and in consequence silicosis is a recognised risk in iron foundries and mines. Zenker (1866) was the first to show that iron (atomic weight 55·84) was deposited in the lymphatics of the lung tissue, but it was Doig and McLaughlin who in 1936 first drew attention to this condition in this country when they reported well-developed reticulation and nodulation in 6 electric-arc welders. Since that time many more cases have been described, by Britton and Walsh (1940), Koelsch (1941), Cramer (1942), Humperdinck (1942), Groh (1944), and Jones and Lockhart (1944), and the condition is well recognised in a bulletin, entitled the Health of Arc Welders in Steel Ship Construction, produced by the United States Public Health Service in 1947. Enzer and Sander (1938) have given the only published account of the necropsy findings.

The welder, who died from an accident, had during life shown the changes characteristic of welder's lung. Post mortem, there was finely distributed black pigmentation throughout both lungs. Histologically, the lymph-glands showed irregularly distributed pigment, almost all of which was in large macrophages. In the lungs there was much amorphous pigment in the periarterial and peribronchial lymphatic channels and the alveolar sacs; but no fibrosis was found either in the glands or in the lung tissue. The blood-vessels were undamaged even where the pigment was densest. Chemical analysis of the lung showed only infinitesimal amounts of silica, but a prussian-blue reaction for iron was obtained.

In 1945 Harding, by intratracheal injection of iron oxide in the form of rouge, produced X-ray opacities in the lungs of rats. These opacities were due to iron in the lymphatics and there was no fibrosis in the lungs.

In 1948 Doig and McLaughlin, reporting further on the 6 cases, stated that, of 2 who had given up welding, the abnormal shadows had disappeared in one and lessened in the other. Siderosis, it would seem, is not necessarily permanent, and if no more iron dust is inhaled the iron oxide is gradually eliminated from the lung parenchyma. They further showed that the 4 men who had continued to work as welders had remained in good health and had not become short of breath.

The Registrar-General's Supplementary Report on Occupational Mortality 1931 shows that there were 123 deaths among 11,452 welders compared with an expected 161 on the basis of age-rates for all males. From all this evidence we may conclude that iron oxide is essentially an inert dust.

STANNOSIS

The atomic weight of tin is 117·8. Pendergrass and Pryde in 1948 recorded a case of a workman aged 45 who for fifteen years had been bagging tin oxide dust

* The Ernestine Henry lecture for 1955, delivered before the Royal College of Physicians of London on June 21.

obtained by treating tin cans with caustic. The patient was discovered by having his chest radiographed, and he complained of no symptoms, even though, on screening, the domes of his diaphragm scarcely moved at all. Scattered throughout the lung fields there was nodulation resembling but rather denser than that found in arc welders. Further reports came from Czechoslovakia (Bartak et al. 1948) concerning 6 men engaged in burning tin in a furnace and from America (Dundon and Hughes 1950) of X-ray nodulation in men calcining scrap tin. The tin content of their lungs was 13·4%. Robertson and Whitaker (1955) found that out of 215 workers at a tin-smelting works in Liverpool 121 who had been exposed to tin oxide dust for more than ten years showed nodular shadowing, but none had symptoms. The lungs of 2 men who died showed that tin was deposited in the lymphatics of the lungs but did not give rise to fibrosis. In rats identical changes in the lungs were produced experimentally; and, though tin could be demonstrated in the periarterial and peribronchial lymphatics, there was again no fibrosis. This condition may be regarded, therefore, as a benign pneumoconiosis similar to the siderosis of electric-arc welders.

ARGYROSIDEROSIS

Silver-polishers use rouge which is iron oxide, and are thus exposed to a dust consisting of a mixture of silver (atomic weight 107·88) and iron. McLaughlin et al. (1945) reported on 4 men who had been polishing silver-plated articles for between twenty and forty years. All had coughs with copious rouge-coloured sputum. Radiography showed the typical picture of reticulation. One of these workers, after a partial gastrectomy for a gastric ulcer, died with bronchopneumonia; and his lungs were found to be emphysematous, with a uniform grey-black cut surface. Microscopy showed no fibrotic changes, either collagenous or reticular, which could be attributed to the dust (Barrie and Harding 1947). There were collections of inert iron in the lymphatics. Of greater interest, however, was the intra-vitam silver oxide staining of the elastic tissue in the arterial, alveolar, and bronchial walls, and there is little doubt that part of the X-ray changes seen in these workers were caused by silver. The ash obtained from the lung (about 10% of the dry weight) contained 72% iron and 6% silver.

Pneumonia

The oxides of manganese, beryllium, vanadium, and osmium can all cause a chemical pneumonia.

MANGANESE DIOXIDE

Manganese is mined in the United States, Cuba, Brazil, the Gold Coast, India, and Russia. It occurs as the oxide in the ores pyrolusite, braunite, hausmanite, and manganite. It is an essential substance in plant and animal nutrition. Its most important alloys are spiegeleisen and ferro-manganese, but silico-manganese and silico-spiegel are used in certain grades of steel. Manganese bronze is used for marine construction and mining machinery where corrosion is serious. The metal is also alloyed with aluminium, tin, arsenic, antimony, bismuth, and boron. Manganese oxide is used for bleaching glass, and other salts are used in dyeing calico, in printing, and as an oxidising agent in making organic products, while manganates and permanganates—produced by the action of caustic soda on manganese oxide—are used for preserving wood, for bleaching textile fibres, and for disinfecting and oxidising.

Chronic manganese poisoning was first described by Couper in 1837, and since that time some 353 cases have been reported. Most attention has been paid to disorders of the central nervous system, the commonest being parkinsonism (Charles 1927, Owen and Cohen 1934, Fairhall and Neal 1943).

TABLE I—MORTALITY (PER 100,000) FROM ALL KINDS OF PNEUMONIA IN VARIOUS LOCALITIES (RIDDERVOLD AND HALVORSEN 1943)

Sauda, Norway, 1924–37	Oslo, 1924–36	Norway, 1924–36	U.S.A., 1933–37	Pittsburgh, 1929–31	Long Beach U.S.A., 1929–31
326	106	82	82	217	42

In 1921 Brezina drew attention to the relation of manganese dioxide to pneumonia: he reported that of 10 men working in a pyrolusite mill 5 had died of pneumonia within two years. The high prevalence of pneumonia among workers making dry-battery cells was ascribed by Baader (1933) to manganese dioxide, while Elstad (1939) observed that the erection of an electric plant for manganese smelting in Sauda, in Norway, was followed by a tenfold increase in the pneumonia mortality-rate of the area. A pall of smoke, containing manganese oxide with particles less than 5 μ in diameter, overhung the town. Immediately before the late war, Buttner (1939) observed that the pneumonia-rate was 17 per 1000 per annum in men working in a Rhenish pyrolusite mine. They had a pneumonia mortality-rate of 6·3 per 1000 per annum compared with 0·54 per 1000 in a control group from Leipzig. Heine (1943) attributed the high prevalence of pneumonia in German factories handling pyrolusite to manganese dioxide.

Riddervold and Halvorsen (1943) described Sauda as an isolated village in western Norway situated at the furthest end of a deep fjord and surrounded by high hills. Sudden changes in weather are experienced and the rainfall is 78 in. per annum. During the erection of the factory in 1915 Sauda had 1500 inhabitants, but the population slowly increased to 4500. The factory started production in 1923 and during that year an epidemic of lobar pneumonia affected the town. Every year since the village has had a relatively high mortality-rate from pneumonia (table I), though the disease is unusual neither in bacteriology nor in age-distribution. These events illustrate the fact that fume produced in factories tends to be extracted through chimneys and pushed into the atmosphere to be inhaled by ordinary citizens.

In 1946 Lloyd-Davies investigated the pneumonia-rate in men handling manganese dioxide in the manufacture of potassium permanganate and compared it with the pneumonia-rate in men employed on other occupations by the same firm (table II).

TABLE II—INCIDENCE OF PNEUMONIA IN A MANGANESE PLANT (LLOYD-DAVIES 1946)

Year	Manganese plant			Other male workers in same firm		
	No. of workers	No. of cases of pneumonia	Pneumonia-rate per 1000	No. of workers	No. of cases of pneumonia	Pneumonia-rate per 1000
1938	47	3	63	5991	3	0·52
1939	40	2	50	6342	3	0·47
1940	67	1	15	6586	6	0·91
1941	101	3	30	6678	4	0·59
1942	124	3	24	6751	6	0·89
1943	101	2	20	4899	6	1·20
1944	70	..	..	5008	5	1·00
1945	75	2	26	4645	1	0·02

He also investigated the dust which the men inhaled at work: collected by an electrostatic precipitator, it had a manganese-dioxide content of 41–66%, and all the particles were below 1 μ in diameter, 80% being below 0·2 μ. Besides the increased pneumonia-rate these workers had frequent attacks of nasopharyngeal catarrh and bronchitis, the symptoms of which always subsided after removal from exposure to the dust. Clinically the pneumonia was not unusual except that it tended to be prolonged—sometimes taking up to three months to

resolve—and the response to penicillin and sulphonamides was slow, probably because the organisms affected by these drugs were no more than secondary invaders. No permanent pulmonary changes were observed.

In mice exposed to manganese dust (Lloyd-Davies and Harding 1949) the histological picture of the lungs was uniform and striking. Mononuclear infiltration of the alveolar walls was followed by intense mononuclear interstitial infiltration with many dust-laden cells. Large areas of consolidation developed, and hæmorrhage, leading to complete disorganisation of the lung structure. These changes were always greatest in close relation to the bronchi: the cells lining the bronchi themselves were swollen and showing hydropic change.

Probably the dust is phagocytosed in the bronchi, and so long as it is contained in the phagocyte it is harmless. When, however, the phagocytic cells die—possibly through the toxic influence of manganese—the dust escapes into the interstitial tissue and damages the cells of the bronchial and alveolar epithelium, causing intense mononuclear proliferation and infiltration, and eventually consolidation of the lung with necrosis and hæmorrhage.

VANADIUM

Vanadium pentoxide is extensively used in making steel alloys. It is an ingredient of the best grades of high-speed steel, in which it exerts a degasifying and deoxidising action, promotes fineness of grain, and causes a stable solution of carbides to form in the iron matrix. It thus imparts to the alloy resistance to fatigue and to shock impact, retention of strength, and hardness when hot. In making steel alloys there is no satisfactory alternative to vanadium. It is also used as a catalyst for various chemical processes.

Dry, irritating, paroxysmal cough with severe hæmoptysis was first attributed to vanadium by Dutton (1911). He also described toxæmic symptoms and thought that tuberculosis was a complication. It was not until 1939, however, that a comprehensive review by Symanski described 19 cases from a metallurgical works in Germany. The men complained of an acute, irritant cough followed by chronic bronchitis.

Lung damage occurring in labourers working over petroleum ash containing vanadium was reported by Balestra and Molfino (1942). In England, however, attention was first drawn to disease from vanadium pentoxide by Wyers (1946). He reported 10 cases of respiratory disease among 90 workers manufacturing the product. The patients complained of cough and shortness of breath; some had hæmoptysis and 3 developed pneumonia from which 1 of them died. Some showed radiological reticulation resulting from the action of vanadium pentoxide as an inert material. Its atomic weight is 50·6.

OSMIUM

Osmium is one of the precious metals. Neither it nor its alloy osmiridium is toxic, but osmium tetroxide is highly volatile and irritating. Raymond (1874) reported a fatal case of poisoning in a man employed by Vulpian in Paris. The fume had given rise to a capillary bronchitis, and necropsy revealed a confluent bronchopneumonia. Brunot (1933) confirmed this finding, and McLaughlin et al. (1946) described the irritating effects of osmium tetroxide in 7 men. They complained of cough with sputum, but no chronic or cumulative effects were noted. Capillary bronchitis and bronchopneumonia have been induced in rabbits with osmium dust.

BERYLLIUM

Beryllium was discovered in 1797 but only in recent years has it become important in industry. Beryllium copper is corrosion-resisting, non-rusting, non-sparking, and non-magnetic, and has good electrical conductivity. It also has high strength and astonishing resistance to fatigue. It is used in precision instruments, altimeters, aeroplane pipe-lines, carburettors, and telephone switchboards, and also in aircraft production. Beryllium steel has such remarkably valuable properties that it will doubtless receive much commercial attention. Beryllium plays a part in the production of atomic energy, being used to make atomic piles. Zinc manganese beryllium silicate is widely used in the manufacture of warm strip lighting.

The principal ore of beryllium is beryl, and beryllium oxide is extracted from it by processing at high temperatures with concentrated acids and fusion methods resulting in fume and dust. Weber and Engelhardt (1933) first showed that this dust could damage the lungs in guineapigs, and Fabrioni (1935) coined the term "berylliosis." In a full investigation of the toxicity of beryllium compounds in animals, Fairhall and his colleagues (1943) succeeded in producing pneumonia experimentally.

Gelman (1936) gave the first account of a disease similar to metal-fume fever occurring in industrial workers in Russia. These workers were using beryllium oxyfluoride and they had an extensive broncho-alveolitis. Berkovits and Izrael (1940) recorded 46 cases in which the symptoms were fever, subsiding in a few days, followed by a second phase characterised by cough, scanty sputum, shortness of breath, temperature up to 103°F, and cyanosis of the face and extremities. Râles were heard at the bases. Radiography showed small, ill-defined, discrete opacities, especially in the middle and lower areas. Anæmia developed and there was leucopenia with relative lymphocytosis. Necropsy showed blockage of the smaller bronchi by inflammatory exudates leading to minute areas of collapse with compensatory emphysema. Usually the patients recovered within 2 months and in most cases resolution was complete, but in a few fibrosis followed.

Fuller accounts of this form of pneumonia have been given from Germany (Meyer 1942, Wurm and Ruger 1942) and from the United States where Van Ordstrand et al. in 1943 first gave a full account of 3 cases of chemical pneumonia among workers extracting beryllium oxide. In 1945 they described symptoms, including dermatitis, observed in 170 workers in three plants during a period of four years. Of these, 38 had chemical pneumonia, and 5 of these died. Bronchoscopy showed a hyperæmic mucosa with some œdema. Radiographs showed diffuse haziness of both lungs, followed first by soft irregular areas of infiltration with prominence of bronchial markings, then by absorption of the soft infiltration and the appearance of discrete large or small conglomerate nodules scattered throughout both lung fields, and finally by clearing of the lungs fields after one to four months though Aub and Grier (1949) showed that they sometimes persisted for as long as a year. Striking features of the lung-tissue secretions were an abundance of plasma-cells with a relative scarcity of polymorphs, diffuse pulmonary œdema, and hæmorrhagic extravasation: fibroblasts with evidence of organisation were present. The beryllium content of the lung varied between 6·20 and 1·89 mg. per g. of dry tissue.

One such case has been reported in England by Royston (1949).

Sarcoidosis

Beryllium sarcoid, a most interesting syndrome, was first reported by Hardy and Tabershaw in 1946. Other reports have come from Gardner (1946), Hardy (1947) and Machle et al. (1948). In the first account 14 men and 3 women were recorded as having developed a delayed pneumonitis, from which 6 died. The condition may arise some months, or as long as two years, after acute symptoms: indeed in some cases there has been a latent period of several years after exposure. Chesner (1950) reported 3 fatal cases in people who were either living

near the factories or belonged to the families of men employed in them. Eisenbud et al. (1949) reported that the atmosphere concentration of beryllium may be as high as 0·1 μg. per c.mm. three-quarters of a mile away from the factory. The symptoms were shortness of breath on exertion, cough, fatigue, and loss of appetite. The shortness of breath is often severe. Râles were usually audible at the bases and in the axillæ, and in some cases a pleural friction rub has been reported. Radiographic changes fall into three stages. In the first there is a fine granularity, uniform and diffuse, extending to the periphery. In the second stage there is diffuse reticular pattern on the granular background; the hilar vascular shadows become fuzzy, indistinct, and slightly enlarged. In the third stage distinct nodules appear uniformly throughout the lungs, giving the appearance of a snowstorm, the hilar shadows appearing large and indistinct. There is also enlargement of the liver, spleen, and lymph-glands, and the diagnosis can be confirmed by finding granulomatous changes in sections of the liver obtained by puncture. Of the cases so far reported, death has occurred in about a third from right-sided heart-failure, concurrent infection, and cachexia, while another third have suffered permanent disability from pulmonary fibrosis and emphysema. With clinical improvement the radiographs may show gradual clearance of the nodules during one to four months; but even a mild respiratory infection may postpone the clearance for as long as a year. Spontaneous pneumothorax has been recorded. The differential diagnosis is established by finding beryllium in the urine and tissues.

Necropsy showed focal and diffuse chronic granulomatous inflammation of all lobes of both lungs, with organisation and fibrosis; diffuse chronic granulomatous inflammation of hilar lymph-nodes with fibrosis; right ventricular cardiac hypertrophy and dilatation; subacute progressive focal and diffuse hepatic nephrosis; and splenomegaly with fibrosis. There was apparently focal intra-alveolar granulomatous change, characterised by centrally and eccentrically located giant-cells of a foreign-body type, together with epithelioid cells, plasma-cells, lymphocytes, and mononuclear cells infiltrating the lesion throughout. Histologically the condition is identical with Boeck's sarcoidosis.

A full account of the only case reported from England was given by Agate (1948). Lloyd-Davies and Harding (1950) produced pulmonary granulomata in 23 rats by intratracheal injection of 50 mg. of berryllium oxide; and the injurious effect on animals of beryllium oxide mixed with traces of beryllium fluorides has also been demonstrated by Policard (1950).

Some workers have reported improvement following treatment with corticotrophin and cortisone, but on the whole these drugs have proved disappointing (Slavin 1952). Attempts to increase the rate of elimination by injection of dimercaprol (BAL) have been equally unsuccessful.

Emphysema

CADMIUM DIOXIDE

In recent years cadmium has assumed increasing importance as an ingredient of metal alloys and as an electroplating material. Exposure takes place in smelting the ore, in making alloys, in electroplating, in making paint pigments, and in welding, where the cadmium may occur as the plating on the metal being welded or as an ingredient of the welding-rod.

Sovet in 1858 first reported that cadmium dioxide can give rise to acute pulmonary lesions. An acute chemical pneumonia may develop within twenty to thirty hours of the inhalation of high concentrations of cadmium dioxide. This has frequently happened in fires, and Spolyar et al. (1944), reviewing the literature, showed that the usual symptoms are chills, irritation of the throat, cough with purulent sputum, pain in the chest, dyspnœa, vomiting, headache, and dizziness. In fatal cases necropsy has usually shown extensive hæmorrhagic œdema of the lungs, and this has also been produced experimentally in animals. The critical period of the illness is usually reached about the seventh day, and if the patient survives ten days there is generally complete recovery. Huck (1947) found 64 cases of occupational origin reported in the literature, with 10 deaths.

Chronic disease was first recorded by Stephens (1920) in a man who complained of cough with mucoid sputum, shortness of breath, weakness, and loss of weight: at necropsy he was found to have a chronic interstitial nephritis. Further reference to the condition was made by Mancioli (1940) and by Nicaud et al. (1942), who believed, however, that the chronic bronchitis and emphysema of their patients were not related to cadmium. Barthelemy and Moline (1946) and Princi (1947), having studied cadmium workers, mentioned various symptoms but concluded that cadmium does not cause chronic ill health. It was not, therefore, until Hardy and Skinner (1947) investigated a group of 5 men exposed for up to eight years to cadmium dioxide, and noted that they had chronic cough, that serious consideration was given to this oxide as a cause of chronic disease. Fridberg (1948, 1950) found that of 58 men making small brickettes of cadmium and iron for the negative pole of accumulators, 43 complained of shortness of breath and dryness of the mouth. All of these had emphysema and 35 had proteinuria, with recognisable impairment of renal function in 9. In later experiments Fridberg (1952) showed, by means of radioactive cadmium, that the amount of the metal excreted in the urine was greatly increased when proteinuria appeared.

Baader (1951) attributed to cadmium poisoning the emphysema he found, with proteinuria, in 8 out of 11 workers in an alkaline accumulator factory in Germany. In a man aged 39, who had been disabled with shortness of breath for eight years, necropsy revealed severe emphysema, fatty infiltration of the liver, and toxic nephritis. It was Lane and Campbell (1954), however, who recorded this syndrome in detail. They described 2 fatal cases of emphysema in men casting copper-cadmium alloy, and give a detailed account of the necropsy in a man who had severe emphysema of an unusual type. It was unusual in that the periphery of the lung was spared and the gross emphysema was central. There were no emphysematous bullæ on the surface of the lung, or in a zone 2 cm. wide under the pleura. There was no evidence of chronic bronchitis. The cadmium content of the lung was 277 μg. per 100 g. of tissue. The symptoms had developed within two years of exposure to cadmium, and the patient died within six years of the onset. This led Bonnell (1955) to investigate 100 men employed in two factories in England where alloys of copper and cadmium were manufactured, and he found 23 with emphysema. These had progressive shortness of breath; their urine contained a protein complex of low molecular weight; and in fatal cases death was from cor pulmonale or from renal failure. In the necropsy which he describes he records that both lobes of the left lung and the lower lobe of the right lung showed great but uneven emphysema. The subpleural zone was not spared.

Buxton (1955) found that the mean residual air, and the residual air expressed as a percentage of the total lung volume, were significantly greater in men who had been exposed to cadmium for more than ten years than in a control series, though the total lung volume was no greater. The mean vital capacity was less than in the control group, but the mixing coefficients were within normal limits. These findings differ from those in chronic obstructive emphysema, where the total lung volume is increased and the intrapulmonary mixing coefficients are abnormal.

This evidence suggests that cadmium dioxide produces a most unusual form of central emphysema, associated with impairment of respiratory function.

Fibrosis of Lung

ALUMINIUM

Aluminium is extensively used in making paint and also in making explosives and incendiary mixtures. Denny et al. (1939) exposed rabbits to metallic aluminium dust of particle size below 5 μ and showed that no fibrosis was produced. On the other hand, Belt and King (1943), from observations on rats, thought that the particles acted as foreign bodies and that fibrous tissue was formed round them. Nevertheless, inhalation of aluminium dust is used widely with the idea of preventing silicosis.

Hunter, Milton, Perry, and Thompson (1944) endeavoured to assess the effects of aluminium oxide dust by studying its effects on the lungs of grinders of 'Duralumin' aeroplane propellers. Though the average concentration of dust close to the operator's mouth was 3 mg. per cubic metre of air, of which 1 mg. was less than 5 μ in diameter, no symptoms and no X-ray changes were found in the 92 workers examined. Similar results had been found by Middleton (1936) and others at a factory manufacturing aluminium. In Pittsburgh, Crombie et al. (1944) investigated 125 workers employed for periods of up to twenty-five years in Pittsburgh stamp mills, and found that their health was as good as that of any other workers in the plant. They had no symptoms and no X-ray changes.

There can be little doubt, then, that in general aluminium oxide does not cause any lung disease. Being of low atomic weight, it does not throw X-ray shadows. However, Goralewski (1939, 1940, 1941, 1943), Jager and Jager (1941), and Koelsch (1942) have reported from Germany that workers exposed to high concentrations of aluminium powder had dry cough with pain on breathing, shortness of breath, and poor appetite: radiography showed a rapidly progressive and extensive fibrosis; many of these patients developed spontaneous pneumothorax; and several died. The illness appeared to come on within three months of starting work. The aluminium powder was made by a stamping process in which, owing to the shortage of stearine in Germany at that time, a paraffin-like substance was used. In the fatal cases the lungs showed coarse branching, hyaline, collagenous fibres which enclosed phagocytes containing fine and coarsely granular particles distinguished from carbon particles by their jagged outline. Animal experiments with this dust by Jotten and Eickhoff (1942) produced a similar histological picture.

In 1947 Shaver and Riddell in Canada reported 35 cases of a similar disease seen in men making the abrasive 'Alundum.' In the manufacturing process bauxite (aluminium oxide) is ground and mixed intimately with iron and coke; the mixture is shovelled into large iron pots, into which carbon electrodes are lowered. The mixture is fused at about 2000°C, with evolution of dense white fumes containing aluminium and silica. These men complained of extreme shortness of breath and later developed a cough with frothy sputum, retrosternal pain, weakness, loss of appetite, and cyanosis. Of 344 men employed at the factory, 23 developed symptoms and 8 had bilateral spontaneous pneumothorax. There were 7 deaths—all in men who had been exposed for less than five years to the dust. The signs in the lungs were variable and consisted in poor movement, impaired percussion note, râles and rhonchi, tachycardia, and cyanosis. In the well-established cases, radiographs showed extensive fibrosis with areas of gross emphysema. At necropsy the emphysema was found to be mostly under the visceral pleura. Microscopical examination of the lungs (Wyatt and Riddell 1949) revealed profound emphysema accompanied by an overwhelming fibrous-tissue formation, endarteritis, proliferation of alveolar epithelium, and bronchiectasis. There was fibrous hyalinisation of the interlobular septa, but no nodular fibrosis. The ash from the lung consisted of 3% silica and 45% aluminium. Pratt (1950) showed that the dust in the atmosphere contained 32·3% silicon dioxide and 56% aluminium oxide, the silicon being almost entirely in the amorphous form.

This condition remains very much a mystery. Most of the considerable numbers of industrial workers in contact with aluminium oxide dust have taken no harm from this exposure. Yet in these two instances in Germany and Canada, exposure of two quite different kinds has given rise to illnesses of identical character.

Carcinoma

In the 16th century Agricola and Paracelsus described a lung condition, occurring among miners in the Erzgebirge in Saxony, which they called "mountain disease." In 1879 Haerting and Hesse identified this as cancer of the lung and showed that it was responsible for 75% of the deaths of miners in this area, developing usually after twenty years' work in the mines. Between 1869 and 1939, there were more than 400 deaths from lung cancer among the Schneeberg miners (Hueper 1942). Arnstein (1913) and Schmorl (1928) showed that the lesion was a carcinoma and not lymphosarcoma or endothelioma as so many tumours of the lung were called at that time. It was seen only in the miners, who all knew, therefore, that it was caused by their occupation. Peller (1939) found that that half the miners in this area had lung carcinoma at necropsy.

In Schneeberg the main ores are sulphides and arsenides of nickel and cobalt, speiskobalt ($CoAs_2$), wassnickelkies (Ni_2As_3), and rotnickelkies ($NiAs$), while at Joachimstal, on the southern side of Erzgebirge, there is a high content of pitchblende and radium. It is probable that the disease is caused by arsenious oxide dust: Rostoski and Saupe (1926) showed that bore dust of these mines contained up to 0·45% of arsenic. Hueck (1939) pointed out, however, that the multiplicity of tumours so frequent in arsenical cancer does not occur in Schneeberg miners; and, since arsenic could not be demonstrated in the urine, hair and nails, or lungs (Pirchan and Sikl 1932, Zeil 1935), it has been suggested that the radioactivity of the dust rather than its arsenic content produces the tumours (Lorenz 1944).

TABLE III—STATISTICS OF A TOWN WHERE MANUFACTURE OF ARSENICAL SHEEP-DIP WAS PRINCIPAL INDUSTRY (HILL 1948)

Percentage Deaths

	Arsenic workers	*Agricultural*	*Labourers*	*Artisans*
Diseases of heart and circulatory system ..	22·7	32·9	25·5	31·5
Diseases of respiratory system	25·3	21·9	23·0	21·5
Diseases of nervous system	8·0	5·6	9·2	11·1
Diseases of digestive and genito-urinary systems	4·0	4·4	5·6	6·7
Infections and general diseases	4·0	9·4	10·7	9·1
Violence	6·7	11·3	12·2	8·0
Cancer	29·3	14·4	13·8	12·0
Total	100·0	100·0	100·0	100·0

Percentages Cancer Deaths by Years

	Arsenic workers	*Other occupational groups*
1910–19	28·6	11·1
1920–29	37·6	14·5
1930–43	31·3	13·0
Total	29·3	12·9

Percentages by Occupation in Arsenic Workers

Chemical workers	39·0
Engineers and packers	30·0
Others (office staff, printers, &c.)	12·5
Total	29·3

Amor (1938) reported 10 cases of carcinoma of the lung, and numerous cases of carcinoma of the nose and nasopharynx, among workers exposed to arsenical dust, over an average period of six years, at a nickel works in South Wales. The concentrated nickel-copper sulphate matte from Sudbury in Canada containing 2% of arsenic for twenty-five years had the copper extracted by the addition of sulphuric acid which contained arsenic as an impurity. The grinding and calcination of the arsenical residue resulted in the escape of much dust from the apparatus in use. The arsenical content of lungs removed by pneumonectomy was 3·82 and 3·40 parts per million.

The most convincing evidence, however, is the statistical work of Bradford Hill and Faning (1948) which showed that in a town in England where the principal industrial work was the manufacture of arsenical sheep-dip the mortality-rate for carcinoma was twice as high in the chemical workers handling arsenic as it was in the rest of the population (table III). The whole of the difference was made up of carcinoma of lung and skin.

Arsenic may account for the world-wide increase in the mortality-rate for carcinoma of lung in males, which has risen sixfold in Great Britain in the past ten years. McConnell et al. (1952) have shown that cigarette fume contains 2·5–3·5 mg. arsenious oxide per cubic metre.

There is also much evidence that monochromates (chromium trioxide) are carcinogens. Mortality data have been studied in the United States by Machle and Gregorius (1948) and Baetjer (1950). Of 193 deaths in 1445 workers employed in seven chromate plants, 66 were from cancer and 42 of these (64%) were from cancer of lung. In a control group of 773 deaths among industrial insurance-policy holders in 1946, only 10 (9%) of the deaths from cancer were from cancer of lung. In chromate workers over 50 years of age the mortality-rate for cancer of lung was forty times that for a comparable industrial group. In plants, however, where the exposure is restricted to bichromates and chromic acid, there was no cancer of lung; which is strong evidence that the carcinogenic substance is the monochromate.

Newman (1890) first recorded the occurrence of carcinoma of the nares in a chromate-worker in Scotland, and reports of carcinoma of lung came from Germany (Pfeil 1935, Alwens et al. 1936, Gross and Koelsch 1943). Gross and Alwens (1939) reported a total of 39 cases and estimated that 3·9% of workers in the chromate industry since 1880 had developed cancer of lung.

Baetjer (1950) studied cases from Baltimore hospitals and collected 122 cases from the literature. 109 worked in the chromate-producing industry and 11 in the manufacture of chrome pigments. 63 cases occurred in Germany, 57 in the United States, 1 in Switzerland, and 1 in Great Britain. The average duration of exposure to chromate was between ten and fifteen years. In Great Britain certain residues containing as much as 1% of monochromate are discarded instead of being crushed and dried as happens in Germany and the United States. It is interesting, therefore, that Bidstrup (1951), in examining clinically and radiologically 724 out of 765 men employed in the chromate-producing industry, found only 1 case of carcinoma of lung. Buckell and Harvey (1951) found that both soluble and insoluble forms of chromium were present in greater concentration in the atmosphere of the factories in Great Britain than in the United States (Bourne and Yee 1950).

Conclusion

With the control of the spread of infection and the use of antibiotics, the infective diseases are declining, and more importance attaches to the degenerative and neoplastic conditions. In this lecture I have tried to show the diverse pattern of pulmonary disease which may result from exposure to dust and fume of metallic oxides in industry.

In the prevention of these diseases the dust and fume are extracted from the air in the factory and passed through chimneys into the atmosphere. At Sauda, in Norway, this is known to have increased the prevalence of pneumonia in the neighbouring population; and in people living near beryllium factories sarcoidosis has been reported.

In the week following the dense fog on Dec. 8, 1952, deaths in London in excess of those usual for the time of year were more numerous than those caused by the Great Plague in 1668; and they have been attributed to acute bronchitis and its complications resulting from the inhalation of the dioxide and trioxide of sulphur extruded by factory and domestic chimneys (Beaver report 1954). Certainly the prevalence of chronic bronchitis and its resultant emphysema are greater in industrial areas than in agricultural areas: in the Merseyside area the rate is more than 1600 per million, against less than 600 per million in East Anglia and Hampshire.

The presence of arsenic in cigarette fumes may account for the higher prevalence of carcinoma of lung in cigarette-smokers.

Control of these various fumes, besides being important for preserving the citizen's health while he is at work is also important for preserving his health when he is at home. It is possible that they play a bigger part in the production of ill health than is at present recognised; and, if this is so, they will play a still bigger part in the future.

REFERENCES

Baratosis

Arrigoni, A. (1933) *Med. d. Lavoro*, **24**, 461.
Pendergrass, E. P. (1938) *In* Lanza's Silicosis and Asbestosis. London; p. 137.
— Greening, R. R. (1934) *J. Path. Bact.* **39**, 233.
Preti, L., Talini, P. C. (1939) Report of Eighth International Congress on Industrial Accidents and Occupational Diseases. Leipzig; vol. ii, p. 963.

Siderosis

Britton, J. A., Walsh, E. L. (1940) *J. industr. Hyg.* **22**, 125.
Cramer, J. (1942) *Arch. Gewerbepath. Gewerbehyg.* **2**, 644.
Doig, A. T., McLaughlin, A. I. G. (1936) *Lancet*, i, 771.
— — (1948) *Ibid*, i, 789.
Enzer, N., Sander, O. A. (1938) *J. industr. Hyg.* **20**, 333.
Groh, J. A. (1944) *Industr. Med.* **13**, 598.
Harding, H. E. (1945) *Brit. J. industr. Med.* **2**, 32.
Humperdinck, K. (1942) *Dtsch. med. Wschr.* **68**, 16.
Jones, T. L., Lockhart, J. A. (1944) *Tex. St. J. Med.* **40**, 532.
Koelsch, F. (1941) *Arch. Gewerbepath. Gewerbehyg.* **10**, 519.
Zenker, F. A. (1866) *Dtsch. Arch. klin. Med.* **2**, 116.

Stannosis

Bartak, F., Tomecka, M., Tomicek, O. (1948) *Čas. Lék. čes.* **87**, 915.
Dundon, C. C., Hughes, J. P. (1950) *Amer. J. Roentgenol.* **63**, 797.
Pendergrass, E. P., Pryde, A. W. (1948) *J. industr. Hyg. Toxicol.* **30**, 119.
Robertson, A. J., Whitaker, P. H. (1955) *Brit. med. J.* i, 598.
— — (1955) *J. Fac. Rad.* **6**, 224.

Argyrosiderosis

Barrie, J. M., Harding, H. E. (1947) *Brit. J. industr. Med.* **4**, 225.
McLaughlin, A. I. G., Grant, J. L. A., Barrie, H. J., Harding, H. E. (1945) *Lancet*, i, 337.

Manganese

Baader, E. W. (1933) *Arch. Gewerbepath. Gewerbehyg.* **4**, 101.
Brezina, A. (1921) Internationale übersicht über gewerbekrankheiten nach den Berichten den Gewerbeinspektionen der Kulturländer über das Jahr 1913. Berlin; p. 40.
Buttner, H. E. (1939) Report of Eighth International Congress for Industrial Accidents and Occupational Diseases. Leipzig; vol. ii, p. 1022.
Charles, J. R. (1927) *Brain*, **50**, 30.
Couper, J. (1837) *Brit. Ann. med. Pharm.* **1**, 41.
Elstad, D. (1939) Report of Eighth International Congress for Industrial Accidents and Occupational Diseases. Leipzig; vol. ii, p. 1012.
Fairhall, L. T., Neal, P. A. (1943) *Nat. Inst. Hlth Bull.* no. 182. Washington, D.C.
Heine, W. (1943) *Z. Hyg. InfektKr.* **125**, 76.
Lloyd-Davies, T. A. (1946) *Brit. J. industr. Med.* **3**, 111.
— Harding, H. E. (1949) *Ibid*, **6**, 82.
Owen, D., Cohen, H. (1934) *Lancet*, ii, 989.
Riddervold, J., Halvorsen, K. (1943) *Acta path. microbiol. scand.* **20**, 272.

Vanadium

Balestra, G., Molfino, F. (1942) *Rass. Med. industr.* **13**, 5.
Dutton, W. F. (1911) *J. Amer. med. Ass.* **56**, 1648.
Symanski, H. (1939) *Arch. Gewerbepath. Gewerbehyg.* **9**, 295.
Wyers, H. (1946) *Brit. J. industr. Med.* **3**, 177.

Osmium

Brunot, F. R. (1933) *J. industr. Hyg.* **15**, 136.
McLaughlin, A. I. G., Milton, R., Perry, K. M. A. (1946) *Brit. J. industr. Med.* **3**, 183.
Raymond, F. (1874) *Progrès méd.* **2**, 373.

Beryllium
Aub, J. C., Grier, R. S. (1949) *J. industr. Hyg.* **31**, 123.
Agate, J. N. (1948) *Lancet*, ii, 530.
Berkovits, M., Izrael, B. (1940) *Klin. Med.* **18**, 117.
Chesner, I. C. (1950) *Ann. intern. Med.* **32**, 1028.
Eisenbud, M., Wanta, B. S., Duston, C., Stradman, L. T., Harris, W. A., Wolf, B. S. (1949) *J. industr. Hyg.* **31**, 282.
Fabrioni, S. M. (1935) *Med. Lavoro*, **26**, 297.
Fairhall, L. T., Hyslop, F., Palmes, E. D., Alford, W. C., Monaco, A. R. (1943) *Nat. Inst. Hlth Bull.* no. 187. Washington, D.C.
Gardner, L. U. (1946) *Trans. industr. Hyg. Foundation*, eleventh annual meeting; p. 1.
Gelman, I. (1936) *J. industr. Hyg.* **18**, 371.
Hardy, H. L. (1947) *Bull. New Engl. med. Centre*, **9**, 16.
— Tabershaw, I. R. (1946) *J. industr. Hyg.* **28**, 197.
Lloyd-Davies, T. A., Harding, H. E. (1950) *Brit. J. industr. Med.* **7**, 70.
Machle, W., Beyer, E. C., Gregorius, F. (1948) *Occup. Med.* **5**, 671.
Meyer, H. E. (1942) *Beitr. Klin. Tuberk.* **98**, 388.
Policard, A. (1950) *Brit. J. industr. Med.* **7**, 117.
Royston, G. R. (1949) *Brit. med. J.* i, 1030.
Slavin, P. (1952) *Amer. Rev. Tuberc.* **65**, 142.
Van Ordstrand, H. S., Hughes, R., Carmody, M. G. (1943) *Cleveland clin. Quart.* **10**, 10.
— — — De Nardi, J. M. (1945) *J. Amer. med. Ass.* **129**, 1084.
Weber, H. H., Engelhardt, W. E. (1933) *Zbl. Gewerbehyg.* **10**, 41.
Wurm, H., Ruger, H. (1942) *Beitr. Klin. Tuberk.* **98**, 396.

Cadmium
Baader, E. W. (1951) Tenth International Congress of Industrial Medicine, Lisbon.
Barthelemy, P., Moline, R. (1946) *Paris Méd.* **1**, 7.
Bonnell, J. A. (1955) *Brit. J. industr. Med.* **12**, 181.
Buxton, R. St. J. (1955) *Ibid* (to be published).
Fridberg, L. (1948) *J. industr. Hyg.* **30**, 32.
— (1950) *Acta med. scand.* suppl. no. 240.
— (1952) *Arch. industr. Hyg. occup. Med.* **5**, 30.
Hardy, H., Skinner, J. B. (1947) *J. industr. Hyg.* **29**, 321.
Huck, F. F. (1947) *Occup. Med.* **3**, 411.
Lane, R. E., Campbell, A. C. P. (1954) *Brit. J. industr. Med.* **11**, 2, 118.
Mancioli, G. (1940) *Rass. Med. industr.* **11**, 632.
Nicaud, P., Laffitte, A., Gross, A. (1942) *Arch. Mal. prof.* **4**, 192.
Princi, F. (1947) *J. industr. Hyg.* **29**, 294.
Sovet (1858) Quoted by Prodan, L. (1932) *Ibid*, **14**, 132, 174.
Spolyar, L. W., Keppler, J. F., Porter, H. G. (1944) *Ibid*, **26**, 232.
Stephens, G. A. (1920) *Ibid*, **2**, 129.

Aluminium
Belt, T. F., King, E. J. (1943) *J. Path. Bact.* **55**, 69.
Crombie, D. W., Blaisdell, J. L., MacPherson, G. (1944) *Canad. med. Ass. J.* **50**, 318.
Denny, J. J., Robson, W. D., Irwin, D. A. (1939) *Ibid*, **40**, 213.
— — — (1939) *Industr. Med.* **8**, 133.
Goralewski, G. (1939) *Arch. Gewerbepath. Gewerbehyg.* **9**, 676.
— (1940) *Ibid*, **10**, 384.
— (1941) *Ibid*, **11**, 106.
— (1943) *Dtsch. TuberkBl.* **17**, 3.
Hunter, D., Milton, R., Perry, K. M. A., Thompson, D. R. (1944) *Brit. J. industr. Med.* **1**, 159.
Jager, R., Jager, F. (1941) *Arch. Gewerbepath. Gewerbehyg.* **11**, 117.
Jotten, K. W., Eickhoff, W. (1942) *Arch. Hyg. Bakt.* **127**, 344.
Koelsch, F. (1942) *Beitr. klin. Tuberk.* **97**, 688.
Middleton, E. L. (1936) *Lancet*, ii, 1479. Industrial Pulmonary Diseases Committee, Medical Research Council.
Pratt, P. C. (1950) Pneumoconiosis: Sixth Saranac Symposium. Editor. A. J. Vorwald.
Shaver, C. G., Riddell, A. R. (1947) *J. industr. Hyg.* **29**, 145.
Wyatt, J. P., Riddell, A. R. (1949) *Amer. J. Path.* **25**, 447.

Carcinoma
Agricola, G. (1556) De re metallica. Basle.
Alwens, W., Bauke, E. E., Jonas, W. (1936) *Arch. Gewerbepath. Gewerbehyg.* **7**, 69.
Amor, A. J. (1938) Report of Eighth International Congress in Industrial Accidents and Occupational Diseases. Leipzig; vol. ii, p. 248.
Arnstein, A. (1913) *Verh. dtsch. path. Ges.* **16**, 332.
Bidstrup, P. L. (1951) *Brit. J. industr. Med.* **8**, 302.
Baetjer, A. M. (1950) *Arch. industr. Hyg. occup. Med.* **2**, 457.
Bourne, H. G., Yee, H. T. (1950) *Industr. Med. Surg.* **19**, 563.
Buckell, M., Harvey, D. G. (1951) *Brit. J. industr. Med.* **8**, 298.
Gross, E., Alwens, W. (1939) Report of Eighth International Congress for Industrial Accidents and Occupational Diseases. Leipzig; vol. ii, pp. 966, 973.
— Koelsch, F. (1943) *Arch. Gewerbepath. Gewerbehyg.* **12**, 164.
Haerting, F. H., Hesse, W. (1879) *Vjschr. gerichtl. Med.* **30**, 296; **31**, 102.
Hill, A. B., Faning, E. L. (1948) *Brit. J. Industr. Med.* **5**, 1.
Hueck, W. (1939) *Z Krebsforsch.* **49**, 312.
Hueper, W. C. (1942) Occupational Tumours and Allied Diseases. Springfield, Ill.
Lorenz, E. (1944) *J. nat. Cancer Inst.* **5**, 1.
Machle, W., Gregorius, F. (1948) *Publ. Hlth. Rep., Wash.* **63**, 1114.
McConnell, R. B., Gordon, K. C. T., Jones, A. T. (1952) *Lancet*, ii, 651.
Newman, D. A. (1890) *Glasgow med. J.* **33**, 469.
Paracelsus, T. (1567) Von der Bergsucht. Dilingen.
Peller, S. (1939) *Hum. Biol.* **11**, 130.
Pfeil, E. (1935) *Dtsch. med. Wschr.* **61**, 1197.
Pirchan, A., Siki, H. (1932) *Amer. J. Cancer*, **16**, 681.
Rostoski, O., Saupe, E. (1926) *Z. Krebsforsch.* **28**, 360.
Schmorl, G. (1938) International Conference on Cancer, London; p. 272.
Zeil, R. (1935) *Med. Klin.* **31**, 1535.

Conclusion
Beaver, H. C. (1954) Report of Committee on Air Pollution. Cmd. 9322. H.M. Stationery Office.

EPIDEMIOLOGY OF INFLUENZA

COMPARATIVE SEROLOGICAL OBSERVATIONS IN ENGLAND AND THE UNITED STATES *

FRED M. DAVENPORT, M.D.
ASSOCIATE PROFESSOR OF EPIDEMIOLOGY, UNIVERSITY OF MICHIGAN

ALBERT V. HENNESSY, M.D.

C. H. STUART-HARRIS, M.D. Lond., F.R.C.P.
PROFESSOR OF MEDICINE, UNIVERSITY OF SHEFFIELD

THOMAS FRANCIS, JUN., M.D., Sc.D.
PROFESSOR OF EPIDEMIOLOGY, UNIVERSITY OF MICHIGAN

With the technical assistance of PHYLLIS FABISCH

From the Department of Epidemiology and Virus Laboratory, School of Public Health, Ann Arbor, Michigan, and the Department of Medicine, University of Sheffield

IT has previously been suggested [11] that in group-A influenza viruses many antigens are shared among the different strains, and that the serological specificity of a given strain is conferred by dominance of one or more of these common antigens. With the passage of time the dominant antigens of influenza viruses have undergone successive changes. The rather dramatic disappearance of influenza A after 1943, and the appearance of influenza A-prime in 1946 is a familiar example. Further it has been inferred that influenza viruses antigenically resembling that of swine influenza were prevalent before, during, and after the pandemic of 1918, and probably persisted until type-A strains appeared.[4 12 15]

The distribution by age of antibodies against swine, and of A and A-prime strains of virus was determined in sera collected in Michigan, U.S.A., during 1952. It was found that the type of antibody characteristic of each of three cohorts of the population was that developed against the major antigens of strains presumably prevalent only during their childhood. Thus, in children less than 10 years of age—i.e., those born after 1943—A-prime antibodies predominated. The principal antibodies of persons aged 10 to 30 were of type A, whilst antibody to swine-influenza virus appeared at age 30 and shortly became the pre-eminent antibody.

These phenomena were explained on the thesis that, throughout life, antibody response to influenza viruses is persistently oriented to the dominant antigens of strains encountered in the initial infections of early childhood. Subsequent exposures to strains of varied but related antigenic composition reinforce the level of primary antibody, whilst the response to major antigens of more recently encountered strains is relatively damped.[4 5 12] Hence, by determining the age of appearance and period of high prevalence of antibody against strains of virus representative of the three antigenic groups, in pools of serum collected currently by consecutive ages, a population's past experiences with influenza viruses may be serologically recapitulated.[4] In such a serological record the episodes of major shifts in the antigenic composition of influenza viruses are delineated. Moreover, the range of antibody found at several periods of life has been shown to correlate with the attack-rate of influenza at these ages.[4 7] The amount of antibody to swine, type-A, or A-prime strains found in the population seems to afford a useful index of the intensity of exposure to these viruses.

An opportunity to extend these observations by simultaneous comparison of antibody levels in a British and an American population was eagerly accepted, since much is known about antigenic variation in relation to the epidemics of influenza which have recurred in England

* These studies were conducted under the auspices of the Commission on Influenza, Armed Forces Epidemiological Board, and were supported by the Office of the Surgeon General, Department of the Army, Washington, D.C. They were presented in part at the 27th annual meeting of the Central Society for Clinical Research at Chicago on Oct. 30, 1954.

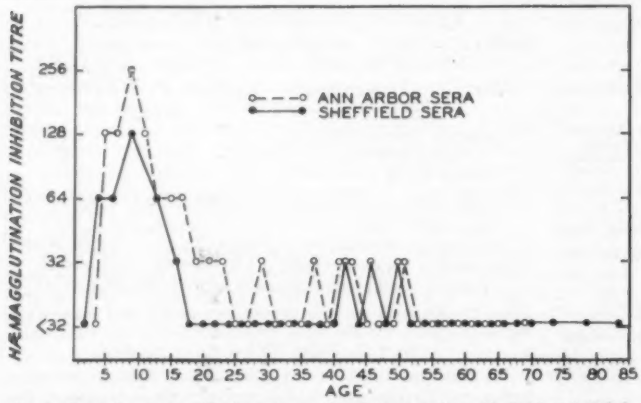


Fig. 1—Type A-prime antibody patterns found in sera from England and U.S.A. test strain : Liverpool (A' England 1951).

and the United States. By such a comparison it could be established whether major shifts in the antigenic composition of influenza viruses had consistently occurred in both countries at the same or at different times. These data might also provide a basis for estimating the relative frequency of experience with influenza viruses in the two populations. (A comparison of the impact of influenza on two populations by mortality or morbidity data alone is notoriously difficult.) Finally, it was of interest to determine whether differences in the serological records correlated with differences in epidemic experiences of the two countries.

Materials and Methods

Sera from Ann Arbor were collected on the wards and from the serological laboratory of the University of Michigan Hospital,† and aliquots of sera were pooled by two-year age-intervals from the first year of life up to and including the 69th year. Sera from persons 70 years old or older were included in a single pool. Each of the 36 pools contained sera from 50 persons, and the collection represented 1800 persons.

Sera from Sheffield were collected from children attending welfare clinics and from samples submitted to the regional Public Health Laboratory from children or adults attending hospitals in or near Sheffield. Aliquots of sera were pooled by intervals of four years from age 7 to 14. Sera from persons 71 to 85 years of age were pooled by five-year intervals. For the rest of the 36 pools from Sheffield, a two-year interval was chosen. 25 of the pools contained sera from 50 persons while the other 11 contained sera from between 23 and 48 persons. The number of sera in the Sheffield collection was 1650.

Both sets of sera were heated twice at 56°C for twenty to thirty minutes and stored in the frozen state for several months. The shorter interval of heating was carried out with the sera from Sheffield, and the period of storage was also shorter. Before use, sera were thawed and stored at 4°C. Sodium merthiolate (1/10,000) was added to the Sheffield sera as a preservative, and a few pools contained 0·08% sodium azide.

Hæmagglutination Inhibition

Non-specific inhibitors of hæmagglutination were destroyed with trypsin, using a modification of the method described by Sampaio and Isaacs.[14] Two volumes of sera were diluted by one of buffered trypsin solution. Buffered trypsin solution contained 0·1 M phosphate at pH 8·2 and 8 mg. of 'Difco' trypsin 1/250 per ml. The mixture was heated at 56°C for thirty minutes.

Hæmagglutination-inhibition tests were then carried out on the treated sera according to the method described by the Committee on Standard Procedures in Influenza Testing.[3]

Viruses

The strains of virus used in this study were from the files of the Strain Study Centre of the Commission on Influenza at Ann Arbor, Michigan, and have been previously described.‡ The strain of swine influenza was received from Dr. Richard E. Shope of the Rockefeller Institute, and is a line of virus derived from the early passages of strain 15. All strains were well adapted to eggs by passage intra-allantoically in 11-day-old chick embryos. Many of the older strains had also been passed in ferrets or mice.

Results

Comparison of Levels of Antibody Measured with A-prime Strains of Influenza Virus in the Ann Arbor and Sheffield Collections of Serum

The titres of hæmagglutination-inhibiting antibody determined in both sets of sera with Liverpool strain (England, 1951) are plotted by age in fig. 1. In the Sheffield sera, antibody was not detected until the age of 4. The amount then rose and reached a peak concentration at the age of 9. Thereafter, the level declined, and from age 18 onwards antibody was rarely detected in the lowest dilution of sera tested. The results with the Ann Arbor sera were similar but differed in two important respects. While the onset of measurable antibody and the peak of antibody concentration occurred in both collections at approximately the same age, the level at the peak was higher and antibody remained elevated for a longer span of years in the Ann Arbor sera. Similar results were obtained when comparisons of antibody content were made with Cam (Australia, 1947), PRu (Holland, 1951) and Cuppett (U.S.A., 1950). With London (England, 1951) and Sweden (Sweden, 1951) viruses, the Sheffield pools were found to be almost devoid of antibody. However, low levels were detected with these strains in the Ann Arbor sera representing ages 4 to 16. A more complex pattern was found with certain A-prime strains of intermediate antigenic character which react in sera pools with antibody to A-prime, to A strains, and to swine-influenza virus. The results

‡ Dr. Keith E. Jensen kindly provided seed of the strains employed.

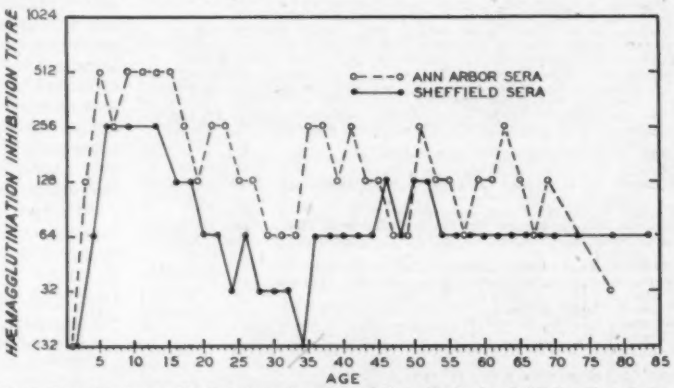


Fig. 2—Type A-prime antibody patterns found in sera from England and U.S.A. Test strain Rhodes (A' Ann Arbor 1947).

† It is a pleasure to acknowledge the coöperation of the personnel of the Serologic Department, directed by Dr. Rubin Kahn.

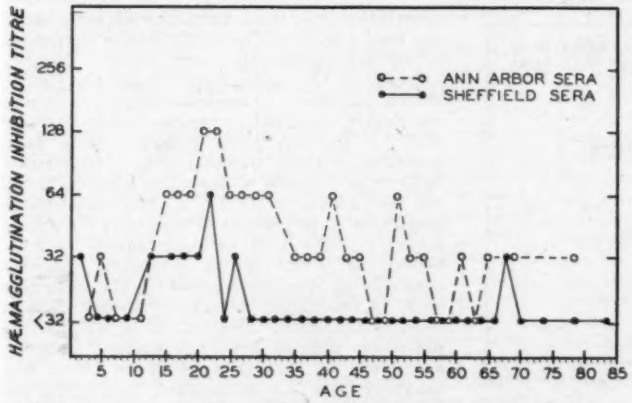


Fig. 3—Type-A antibody patterns found in sera from England and U.S.A. Test strain: Talmey (A England 1935).

with Rhodes virus (U.S.A., 1947) are shown in fig. 2. The findings with FMI (U.S.A., 1947), Moravec (U.S.A., 1951), and Wright (U.S.A., 1953) were similar. As with other A-prime strains, antibody was detected in both collections at the 3rd or 4th year of age. However, with these more broadly reacting strains the peak level was higher and tended to be maintained longer. Around 13 to 15 years, the concentration of antibody began to decline. In the sera from Ann Arbor, a secondary rise and fall in antibody level is seen extending from ages 19 to 29. As was previously shown in sera pools collected in Michigan, this interval marks the attainment of and decline from the maximal levels of antibody measurable with A strains. A comparable secondary rise is not seen in the sera from Sheffield, although in the same interval antibody remains measurable at low titres. The absence of a secondary rise and fall in the age-period 19 to 29 in the Sheffield sera suggests that this segment of the British population has had less experience during childhood with type-A strains that are closely related antigenically to these broadly reacting A-prime viruses. At the ages of 35 to 36 an increase in antibody is found in both collections of sera, and moderate levels are then maintained for the later ages. From the age of 35 onwards, high levels of antibody to swine virus are found in human sera.[4]

In general, these data duplicate those of the previous American studies which delineated the time of life when antibody against most A-prime strains appear and are present at high levels. Again, they illustrate the striking correlation between the known high incidence of influenza in childhood and the fact that epidemics of influenza in the United States and Great Britain since 1946 have been predominantly influenza A-prime. Moreover, the higher and broader patterns of antibody distribution found in the Ann Arbor sera suggest that the amount of experience with A-prime strains has been greater in that population.

Comparison of Antibody Levels with A strains

The antibody patterns determined with the Talmey strain (England, 1935) of influenza A are shown in fig. 3. In the pools representing the first decade of life, antibody to A strains was virtually absent at the dilutions tested. From the age of 12, antibody levels rose, reaching a maximum in both sets of sera at about 22 years. As with the A-prime strains, the peak levels with the A strains were higher in the Ann Arbor sera. Furthermore, the duration of the interval when antibody was detectable was longer in the sera from Michigan. Results similar to those illustrated were obtained in comparisons with PR8 (Puerto Rico, 1934), Berry (England, 1941), Gideon (Hawaii, 1940), and Taylor (England, 1941) strains.

A peculiar saddleback antibody pattern was found in the Sheffield sera with a few A strains. In fig. 4, the results with Melbourne (Australia, 1935) are reproduced. Similar data were obtained with Weiss (U.S.A., 1943) and BH (England, 1935). The pattern of antibody distribution in the Ann Arbor sera was similar to that measured with the Talmey strain (fig. 3) except that the peak level attained was higher, and antibody was sustained at approximately the same level between the ages of 25 and 72. In contrast, with the sera from Sheffield relatively low levels of antibody were found at 13 to 28 years of age. From 30 to 40, antibody content is diminished, but thereafter the levels rise and at most ages they either equal or exceed the peak levels found in the second and third decade. From the age of 30 onwards, the level of antibody to swine virus is known to rise,[4] and the pattern seen in the Sheffield sera, after 30, probably represents swine antibody that cross-reacts with Melbourne virus (see below). It is noteworthy that antibody levels in the Ann Arbor sera between 30 and 40 years of age do not show a similar decline. It will be shown that this difference cannot be attributed to differences in the swine-influenza antibody content of the two collections. Therefore, it seems likely that the disproportionate low levels of antibody to Melbourne virus found in the Sheffield sera between the ages of 30 and 40 represent a difference in the intensity of experience of the two populations with an unidentified strain of group-A influenza virus, which occurred during the childhood of this cohort of the population.

Additional evidence of a disparity in the intensity of the experience of the two populations with A antigens was obtained with other strains. For example, with Christie (England, 1937) and Gatenby (England, 1937) antibody did not appear in the Sheffield sera until the age of 18, rose to a titre of 32, and persisted at that low level until the age of 27. After that, virtually no antibody was found. In the Ann Arbor sera, antibody appeared to Christie at age 13 and to Gatenby at 15. In other respects, the patterns with these strains were like that illustrated with Talmey. With WS (England, 1933) and Baum (U.S.A., 1940), no patterns of antibody distribution were

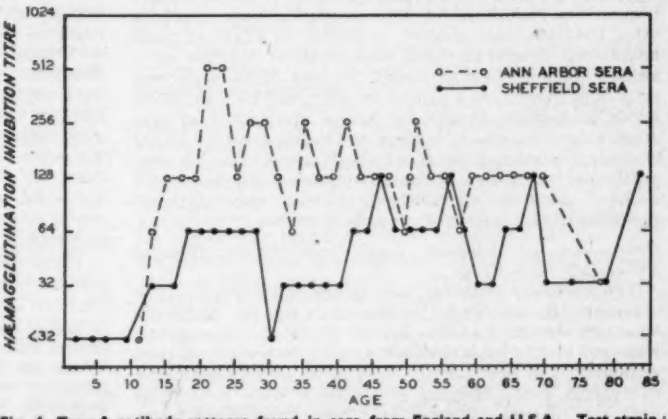


Fig. 4—Type-A antibody patterns found in sera from England and U.S.A. Test strain: Melbourne (A Australia 1935).

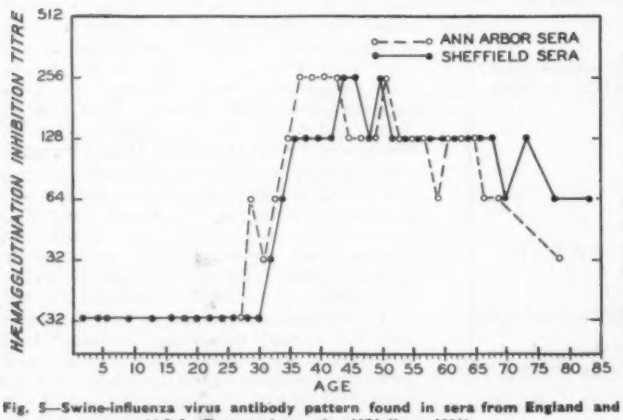


Fig. 5—Swine-influenza virus antibody pattern found in sera from England and U.S.A. Test strain : swine 1976 (Iowa 1931).

discernible in the sera from Sheffield, since titres were generally below 32. However, in the Ann Arbor sera, the pattern found with Baum and WS was like that found with Talmey except that the appearance of antibody to WS was delayed until 18 years of age. In all cases the amount and duration of measurable antibody were greater in the sera from Ann Arbor, which suggests that the amount of experience with A strains of influenza virus was greater in the American population.

The virtual absence, in both sets of sera, of antibody to A strains in children aged 10 or less in 1953 correlates with the disappearance in 1943 of influenza A from England and the United States.

In addition, it is evident that with the passage of time there has been a progressive shift in the age at which antibody against A strains is found in both populations. Thus, with sera collected in 1935 from the United States and England, it was shown that antibodies to the WS and PR8 strains were often present in the first few years of life.[1 8] In 1948 [13] they were not found in the sera of American children until the age of 7, and in the present study, with sera collected from both countries in 1953, antibodies against that strain were not measurable until 12 years of age. It is expected that this shift will continue, since fundamentally it results from the lifelong persistence of the orienting effect of the dominant antigens of the strains responsible for the initial infections of childhood, which modify the antibody responses following subsequent exposures to antigenically different but related strains of influenza virus. The gap created by this progressive shift has been filled by antibodies to A-prime strains because the experience of children born in both countries after 1943 has been limited to strains of that antigenic character. It will be noted that levels of A-prime antibodies begin to decline about the age of 12 when the level of antibodies to A strains is rising, and that antibody levels to A-prime strains are low or undetected at ages when concentrations of type-A antibodies are high. This reciprocal relationship is seen in both sets of sera. Clearly, antibodies to A strains found in the second and third decades tend to limit infections with and antibody response to the currently prevailing viruses.

Comparison of Antibody Levels with Strain 1976 of Swine-influenza Virus

The antibody patterns ascertained with strain 1976 of swine-influenza virus are shown in fig. 5. Antibody was first detected at the age of 28 in the Ann Arbor sera and at 32 in the Sheffield sera. The level then rises promptly, and between the ages of 35 and 70 high and equivalent concentrations of antibody were present in both sets of sera. Thereafter, a tendency toward lower antibody levels was discernible. The observation can be made anew from these and other data that there has been a shift in the age at which antibodies to swine-influenza virus are found. In sera collected in 1935 from England and the United States, antibody to swine-influenza virus was not usually detected in persons below 10 years old.[1 15] In sera pools collected from both countries in 1953, antibody was unmeasurable until 28 to 32 years of age. The increase in the age at which antibody is first measurable again marks the passage of time with surprising accuracy. The shift in age-incidence of antibodies to swine virus represents another example of the persistence of the orienting effect of the major antigens of strains encountered in the initial infections of childhood. As previously pointed out, high levels of antibody are found in persons aged 35 or older, and maximal levels are maintained until about the age of 50.[4] The persons with the highest titres are those who were children or young adolescents in 1918, the year of the greatest incidence of pandemic influenza. Laidlaw [12] and Shope [15] first suggested the possibility that swine-influenza virus was the strain responsible for the 1918 human epidemic. The age-incidence of antibodies to that strain as now determined supports their hypothesis. The data also indicate that strains of virus antigenically similar to swine virus and the virus of the 1918 pandemic were probably prevalent before and after 1918, since antibody levels are high for several decades and some of the persons showing antibody to swine virus were born after 1918.

Discussion

The patterns of distribution of antibody determined with many strains of influenza virus in sera pools collected from England and the United States during 1953 are remarkably similar in several respects. In general, the ages at which antibody became measurable with A-prime and A viruses and with a single strain of swine-influenza virus were approximately the same in the two collections. High levels of antibody to these test viruses were found in both sets of sera at similar periods of life, although antibody to A and A-prime strains was present in the Ann Arbor sera at a greater concentration for a somewhat longer period. Since the age at which antibodies to prototype strains begin to appear indicates the end of the period of prevalence of strains antigenically closely related to these prototypes, it follows that major shifts in the dominant antigens of influenza viruses were experienced in both countries at about the same time. This inference is supported by the observation that the prevailing type of influenza virus changed from A to A-prime in both countries between 1943 and 1947. The serological records obtained in this study indicate that about thirty years ago a major antigenic shift occurred in both countries. In this shift the A group of antigens became the dominant ones, while the antigens shared with swine-influenza virus became minor antigenic components of strains which then prevailed until 1947. The basis for this inference is that around the age of 30 antibody to swine-influenza virus begins to appear and, concurrently, levels to A strains tend to decline in both collections.

The most striking differences found in the antibody content of the sera from Ann Arbor and Sheffield fall into three categories :

When antibody patterns were discernible in both sets of sera with a given strain of type-A or A-prime influenza virus, antibody levels were slightly higher, and the period of measurable antibody was somewhat longer, in sera from Ann Arbor.

In other instances, no antibody patterns were discernible in the Sheffield sera, while patterns at moderate or

high levels were found with the same strains of A-prime or A viruses in sera from Ann Arbor.

Thirdly, there is the curious gap in measurable antibody levels detected with certain A-prime and A strains in the Sheffield sera, which extends from around age 17 to 40.

It might be supposed that these differences were an artefact caused either by errors in sampling of the true antibody content of both populations or by denaturation of antibody in the Sheffield sera in the course of collection, processing, storage, or transport. While neither of these explanations can be ruled out, both seem highly unlikely. Three separate collections of sera from Ann Arbor yielded closely similar antibody patterns.[4 9] Hence, the number of sera collected in each age-group for the present study would seem to provide a reliable sample of the antibody content of the populations studied. Nor does it seem likely that the lower antibody levels found with A and A-prime strains in the Sheffield collection can be explained by denaturation of the sera. The antibodies which inhibit hæmagglutination by influenza viruses are quite stable, and preservative had been added to the Sheffield sera to protect their antibody content.

Finally, the differences in the antibody patterns obtained with sera from Sheffield and Ann Arbor were systematic. Approximately the same levels were found with swine virus, and the differences found with A strains were proportionately greater than differences found with A-prime strains. These systematic differences are not readily attributable either to errors in sampling or to denaturation. Sampling errors would produce random differences, and denaturation would be expected to lower antibody levels to all strains of influenza viruses proportionately.

A more logical explanation of the differences found in antibody patterns with sera from Ann Arbor and Sheffield can be offered—an explanation supported by data from independent studies. Since the antibody patterns determined with swine-influenza virus in the two sets of sera were so similar, the amount and the period of exposure of both populations to strains antigenically like swine virus was presumably comparable. However, the lower and narrower patterns of antibody distribution found in the sera from Sheffield with A-prime and especially with A strains suggest that the Sheffield population has had less experience with strains of these types. With respect to experience with A strains, this inference can be documented. Thus antibody to the PR8 strain of type-A influenza virus was not found in approximately half of 435 sera collected at random in 1949 from adults in Northern England, when diluted 1/40.[10] In contrast, approximately 90% of the sera collected in 1953 from adults in Michigan showed antibody levels of 1/32 or greater to the same strain.[9] Since it has been shown that antibody levels to type-A strains are not significantly increased by exposure to A-prime strains unless the population exposed has had previous experience with type-A strains,[5 9] the difference in frequency of antibody to PR8, although observed in different years, independently corroborates the concept that the population in Sheffield has had less experience with those A strains of influenza viruses that are antigenically related to PR8.

In previous publications [4 7] attention was called to the relation between the age-incidence of influenza and the character of antibodies found in the American population at various ages. Thus, the sera of children were shown to contain antibodies of limited scope essentially oriented toward the dominant antigens of the strains recently prevailing. Apparently antibody of this limited character confers little immunity, since the incidence of influenza in America has been consistently higher in childhood. With increasing age and repeated infections by antigenic variants of influenza virus, the older American population has acquired a composite of antibody against a greater number of antigens. In consequence, the serological foundation of immunity becomes broader, and concurrently the incidence of influenza is lessened in the older age-groups irrespective of the strain in circulation.[4]

It will be recalled that antibody levels with A-prime and A strains of influenza virus were lower in the sera from Sheffield, and that the duration of measurable antibody was always less in that collection. Moreover, with some A-prime and A strains, essentially no antibody was measurable in the Sheffield sera, while moderate to high levels were found in the Ann Arbor sera with the same strains. As a result, the composite of antibodies in the Sheffield population did not attain as high a level as that found in the Ann Arbor population. If these findings are representative of antibody levels in both countries, as they are believed to be, then it would be expected that the incidence of influenza at present in England would not show the striking decrease with age which has been repeatedly found in America.

Only two comparable studies are available to test this hypothesis. Hope Simpson has reported on the secondary-attack rate of influenza in 100 families observed during the epidemic of 1951 in which an index case had occurred.[10] In these circumstances, the secondary-attack rate was found to be essentially the same at all ages. In contrast, in a similar study made in America during the epidemic of influenza A-prime in 1953 [2] the secondary-attack rate was shown to decline progressively with age. If the results of these studies are typical of the current age-incidence of influenza in England and America, the epidemiological events are in agreement with our explanation of our serological findings.

The low levels of the composite of antibodies found in the sera from England may help to explain the disparity in the intensity of recent epidemics of influenza in England and the United States. Since 1932 the annual influenza mortality-rates per 100,000 population in England and Wales have been consistently greater than in the United States.[6] The most striking disparity was seen in 1951, when there was a severe epidemic in England but only a mild one in the United States. The greater incidence of influenza in England correlates with the lower levels of antibody found in the Sheffield sera.

Finally, the disparity in levels of antibody in sera collected from England and the United States, and the differences in the incidence of influenza in the two countries, poses the question whether it is desirable to widen the spectrum of antibodies found in the British population by vaccination against influenza.

Summary

A comparison of antibody levels observed with prototype strains of influenza viruses in sera collected during 1953 from persons in Sheffield, England, and Michigan, U.S.A., indicates that:

(1) Similar shifts in dominance of the antigens which comprise group-A influenza viruses occurred in both countries at the same time.

(2) Levels of antibody to type-A strains were considerably lower in Sheffield. A lesser difference was observed in antibody levels to A-prime viruses, while the amount of antibody to swine-influenza virus was essentially the same in the two populations.

(3) The lower levels of composite antibody found in the Sheffield sera correlates with, and may help to explain, the apparently higher incidence of influenza in England.

This work would not have been possible without the assistance of those who so willingly supplied blood samples. In particular, we would like to thank Dr. E. H. Gillespie and Dr. L. P. Clarke of the Public Health Laboratory Service; Dr. Marion C. Taylor of the school medical service, Sheffield; Dr. B. Snell and other medical officers of the Infectious Diseases Hospital, Lodge Moor; and Dr. J. L. Emery of the Children's Hospital, Sheffield; and members of the staff of the Department of Medicine of the University of Sheffield.

References overleaf

HÆMATOGENOUS OSTEITIS IN THE NEWBORN

WALLACE M. DENNISON
M.D. Glasg., F.R.C.S.E., F.R.F.P.S.

BARCLAY LECTURER IN SURGERY AND ORTHOPÆDICS IN RELATION TO INFANCY AND CHILDHOOD IN THE UNIVERSITY OF GLASGOW; SURGEON IN CHARGE OF WARDS, ROYAL HOSPITAL FOR SICK CHILDREN, GLASGOW; PÆDIATRIC SURGEON, ROYAL MATERNITY HOSPITAL AND STOBHILL HOSPITAL, GLASGOW

As a result of the successful treatment of septicæmia in the newborn, more small infants are living long enough to show clinical evidence of hæmatogenous osteitis. In the years 1945–51 19 cases of neonatal osteitis were treated in one surgical unit of the Royal Hospital for Sick Children, Glasgow (Dennison and Macpherson 1952a). Since then 22 other children have been treated, and the further experience so gained has led to modifications in treatment.

Fraser (1924) stated that osteitis of the newborn was almost always fatal, whereas Dillehunt (1935), Cass (1940), and Stone (1942) regarded it as benign and gave a good prognosis for life and function. The confusion was clarified by Greengard (1946) and Thomson and Lewis (1950), who showed that it could present in either a benign or a severe form, the latter being called generalised osteitis of the newborn.

Of the 41 patients admitted to this unit in 1945–55, 22 can be classified as benign because at no time did the lives of the infants appear to be seriously endangered. The actual bone and joint lesions, however, were not always benign, and a few children have been left with permanent bone and joint deformity. The focus was in such cases usually single, and the sites are shown in the accompanying table. As these patients present no new problems they are not considered further here.

SITE OF BONE FOCUS IN 22 CASES OF BENIGN NEONATAL OSTEITIS

Site of bone focus		No. of cases	Result
Staphylococcal *	Streptococcal		
Maxilla	—	8	Complete recovery
Humerus	—	5	Destruction of head of humerus in 3 cases
Clavicle	—	1	Complete recovery
Femur	—	4	Destruction of femoral head in 2 cases Destruction of distal epiphysis in 1 case
Calcaneus	—	1	Complete recovery
Talus	—	1	Complete recovery
—	Femur	1	Complete recovery
—	Ulna	1	Complete recovery
Total	—	22	—

* Resistant to penicillin in 16 cases.

Of the 19 severe cases, 4 children were no longer seriously ill when admitted to the surgical wards. The septicæmia had been controlled by one or other of the wide-spectrum antibiotics. The septicæmia had presented as pneumonia or as gastro-enteritis, and only the appearance of a swelling of a limb or a joint brought the patient to a surgical unit. Of the 19 patients 18 were born in an institution (hospital or nursing-home), and all of them had left the care of the obstetrician before there was evidence of serious infection.

In many instances it has been possible only in retrospect to reconstruct the sequence of events leading to pyogenic bone-infection. The infection was caused by an anaerobic hæmolytic streptococcus in 1 (fatal) case, and in 1 patient the organism was not isolated. In the remaining 17 patients the organism was a coagulase-positive *Staphylococcus aureus*: this was sensitive to penicillin in 2 cases, the sensitivity not assessed in 1 case, and it was resistant to penicillin in 14 cases.

Of the 19 patients 4 died. Recurring infection, sequestrum formation, and epiphyseal and metaphyseal damage led to a high morbidity.

Fig. 1—Case 1: destruction of right femoral head with subluxation of hip; destruction of lateral condyle of right femur and medial condyle of left femur leading to gross valgus (right) and varus (left) deformity.

Typical Cases

Case 1.—A boy, aged 3 weeks, was admitted with swelling over the left clavicle, swelling of both thighs, and effusion in both knee-joints. His mother had a staphylococcal breast abscess but did not breast-feed him.

On admission he was treated with penicillin 20,000 units three-hourly until the staphylococcus grown from the blood was reported resistant to penicillin. Penicillin therapy was stopped and treatment with chlortetracycline (aureomycin) 25 mg. six-hourly substituted. The boy's temperature was normal within twenty-four hours, and his general condition improved rapidly. Seven days later there was a shortage of chlortetracycline and he was treated with penicillin for five days. During this period his temperature rose and his general condition deteriorated until chlortetracycline therapy was restarted. This treatment was continued for a further fourteen days, and pus was evacuated from the clavicular region, from the right hip, from a large intrapelvic abscess, and from both knee-joints. The right femoral head was destroyed, and there was gross damage to the lower end of both femora, leading to genu valgum of one leg and genu varum of the other.

Osteotomies have been performed on three occasions, but there is still gross deformity (fig. 1).

DR. DAVENPORT AND OTHERS: REFERENCES

1. Andrewes, C. H., Laidlaw, P. P., Smith, W. (1935) *Brit. J. exp. Path.* **16**, 566.
2. Bell, J. A. National Microbiological Institute, National Institutes of Health, Bethesda, Maryland. Personal communication.
3. Committee on Standard Serological Procedures in Influenza Studies (1950) *J. Immun.* **65**, 347.
4. Davenport, F. M., Hennessy, A. V., Francis, T. jun. (1953) *J. exp. Med.* **98**, 641.
5. — — — (1955) *Fed. Proc.* **14**, 460.
6. Deutschman, L. (1953) *Bull. Wld Hlth Org.* **8**, 633.
7. Francis, T. jun. (1953) *Ann. intern. Med.* **39**, 203.
8. — Magill, T. P. (1936) *J. exp. Med.* **63**, 655.
9. Hennessy, A. V., Davenport, F. M. (1954) *Fed. Proc.* **13**, 497.
10. Hope Simpson, R. E. (1951) *Proc. R. Soc. Med.* **44**, 798.
11. Jensen, K. E., Francis, T. jun. (1953) *J. exp. Med.* **98**, 619.
12. Laidlaw, P. P. (1935) *Lancet*, i, 1118.
12. Melnick, J. L., Ledinko, N. (1951) *Amer. J. Hyg.* **54**, **354**.
14. Sampaio, A. A. C., Isaacs, A. (1953) *Brit. J. exp. Path.* **34**, 152.
15. Shope, R. E. (1936) *J. exp. Med.* **63**, 669.
16. Stuart-Harris, C. H. Unpublished data.

Case 2.—A boy, aged 3 weeks, developed diarrhœa. A week later there was swelling of the right shoulder, and he was admitted to hospital with severe septicæmia and gross swelling of his left leg. A penicillin-resistant staphylococcus was grown from his blood, his urine, and a rectal swab. He was treated with chlortetracycline, at first intravenously and then by mouth, for eight days. Pus was evacuated from the left knee and from a subperiosteal abscess over the left tibia. On the thirteenth day there were signs of bronchopneumonia, and radiography revealed extensive osteitis of the tibia (fig. 2). Chlortetracycline therapy was restarted and continued until the twenty-sixth day. The infant remained in hospital for three months. At the age of 9 months his left kidney was removed for gross pyelonephritis and multiple calculi.

The final sequestrectomy was performed when the boy was a year old. At the age of 4 years he is well, with no deformity and with satisfactory kidney function. There is no radiographic evidence of active disease of bone.

Fig. 2—Case 2: extensive osteitis of left tibia.

Case 3.—A boy, aged 3 weeks, developed a left inguinal abscess and diarrhœa. Three days later his left leg became swollen and red, and he was admitted to hospital and treated with penicillin for two days, until the staphylococcus isolated from the blood was reported resistant to penicillin. Penicillin therapy was discontinued and chlortetracycline therapy started and continued for four weeks. The infant became deeply jaundiced, and bone lesions were found in his left tibia and right radius. Metastatic foci appeared in his right arm, left hand, and right wrist, and he developed pneumonia. A long sequestrum was removed from the tibia two months after admission, the wound healed uneventfully, and the infant was sent home.

During the next three years he was readmitted to hospital thirteen times. He has had 37 recognised metastases, involving most of his long bones, his scapula, his spine, and his pelvis. He has been treated with chloramphenicol and the tetracyclines, with penicillin-streptomycin ('Crystomycin'), with coagulase, and with stock and autogenous vaccines. He is now attending with soft-tissue abscesses of the thigh, but no new bone-lesions have been seen in the past two months.

Fig. 3—Case 4: deformity and shortening of right femur.

Case 4.—Eight days after this girl was born her mother had a "septic throat" and coagulase-positive staphylococci were grown from the mother's vagina. At the age of 10 days the baby was cross when lifted, and next day there was swelling of her right thigh and knee and right wrist. She was given penicillin 800,000 units and transferred to the children's hospital next day. There was no radiographic evidence of bone-disease on admission, and, as the general condition was reasonably good, systemic antibiotics were deliberately withheld. Pus was evacuated from the femoral subperiosteal abscess and from the knee, and chlortetracycline solution was instilled locally. A penicillin-resistant coagulase-positive staphylococcus was grown from the pus. The infant remained apyrexial for nine days, but an abscess then appeared over her right scapula. Radiography revealed bone disease of her femur, radius, and scapula. Pus was aspirated on several occasions from her right shoulder, thigh, knee, and wrist. Treatment with oral chlortetracycline was started twelve days after admission and continued for fifteen days. The limbs were immobilised, and she remained in hospital for thirty-eight days.

During the next eighteen months she was readmitted twelve times. Her femur is still grossly deformed (fig. 3).

Case 5.—A boy was born with a swelling over his sternum; his left leg became swollen on the 7th day; and on the 18th he had diarrhœa and vomiting and a generalised rash. Next day both arms were swollen and his eyes were puffy. At the age of 21 days he was admitted to the medical wards with a diagnosis of septicæmia. A penicillin-resistant staphylococcus was grown from his blood, and blood-culture remained positive throughout his brief life. He was treated with chlortetracycline for five days, with chloramphenicol for seven days, and thereafter with oxytetracycline (terramycin) until transferred to the surgical wards fifteen days after admission. Both his arms were paralysed, and radiography revealed osteitis of both femora with arthritis of his shoulders. Pus was aspirated from many sites but in spite of repeated small blood-transfusions, the general condition steadily deteriorated. Erythromycin was given during the last ten days of life and he died at the age of 10 weeks.

Necropsy revealed bone lesions in the clavicles, sternum, humeri, three ribs, three vertebral bodies, and both femora. There were no pyæmic abscesses in the heart, lungs, or kidneys.

Discussion

After the first week of life, infection is the most important single cause of neonatal death, pneumonia and gastro-enteritis being of outstanding importance. It is perhaps not generally recognised that either pneumonia or gastro-enteritis may be the presenting signs of septicæmia; and, if treatment is delayed or inadequate, pyæmic lesions may form in any organ. Before the introduction of antibiotics the prognosis in septicæmia of the newborn was poor, and few babies lived long enough to show evidence of bone infection.

The fœtus is usually bacteriologically sterile until the membranes rupture, although there is evidence to show that intra-uterine infection may be more common than is generally appreciated (Douglas and Stander 1943, Corner et al. 1951). After rupture of the membranes the fœtus may inhale or swallow infected liquor amnii or may encounter virulent organisms in the vagina. After delivery there are many possible sources of infection, particularly the skin and upper respiratory tract of the mother and attendants. Before there is evidence of severe infection paronychia, skin pustules, or infection of the cord stump may be observed. Minor staphylococcal infections appear in 10–15% of infants born in maternity units (Nelson 1952, Barber et al. 1953, Forfar et al. 1955), and the incidence of such infection is increasing (Capon 1955). Such apparently minor lesions must be treated seriously by the obstetrician or the pædiatrician because major infections rarely develop until the mother and child have gone home. At present there appears to be a very inadequate follow-up of the infant during the two or three weeks after discharge from hospital.

Although the infant may be born with congenital immunity to certain organisms to which the mother is immune, the capacity for antibody formation during the neonatal period is generally very poor. In the first 7 of the present 19 cases the infants were treated with antibiotics for three or four weeks, and prolonged treatment with chlortetracycline had no apparent adverse effect on the infants (Dennison and Macpherson 1952a). Shortly afterwards there were repeated recurrences. Long-continued use of a bacteriostatic antibiotic in an infant who had inherited no immunity from his mother appeared to deprive him of the opportunity of acquiring

immunity to the staphylococcus. Metastatic foci appeared while the infants were receiving the recognised therapeutic dose of chlortetracycline. Commercial preparations of antitoxin and autogenous vaccines had no apparent influence on the infection.

In the surgical wards of this hospital severe toxæmia is most commonly seen in acute hæmatogenous osteitis and in diffuse peritonitis following appendicitis. In acute osteitis, apart from the neonatal age-group the causal staphylococcus was resistant to penicillin in only 4 of 140 cases (2·8%) treated since 1945. Penicillin was undoubtedly the antibiotic of choice, and antibiotics of the tetracycline group were used in only 6 cases. The impression was gained that these newer preparations were less effective than penicillin in dealing with the local focus of disease in the bone. A serious objection to the tetracycline group was the lack of an effective method of assaying blood and bone-marrow when judging the correct duration of antibiotic therapy (White and Dennison 1952). In the 19 cases of severe neonatal osteitis the sensitivity of the causal staphylococcus was tested in 16 of the 17 staphylococcal infections. The staphylococcus was resistant to penicillin in 14 patients (87%). Chlortetracycline controlled toxæmia in most cases but appeared to have little effect on the foci of disease in the bone. In diffuse peritonitis, particularly in children under the age of 3 years, chlortetracycline was life-saving (Dennison and Macpherson 1952b). In view of the reports of staphylococcal enterocolitis following the administration of the wide-spectrum antibiotics, particularly of the tetracycline group (Hay and McKenzie 1954), the use of the tetracyclines was temporarily stopped in October, 1954, and a penicillin-streptomycin preparation was substituted. Such preparations as crystamycin and 'Seclomycin' appeared to be as efficacious as chlortetracycline in combating the toxæmia of diffuse peritonitis. In the surgical unit concerned in this report the chief use of the antibiotics is to save life, and they are usually discontinued as soon as toxæmia is under control. During the past six months we have, as a routine, used bactericidal penicillin-streptomycin preparations for ill patients with neonatal septicæmia and diffuse peritonitis.

Potter (1954) described 6 cases of osteitis of the newborn, of which he classified 5 as "benign." Although no antibiotics had been administered before admission, the general condition of these 5 infants never gave rise to anxiety. Nevertheless "benign" is hardly a satisfactory description of a condition which is often characterised by recurrences and not uncommonly leads to permanent deformity. The present cases have also been divided into "benign" and "severe," but I feel that this is a very personal classification. Almost a quarter of a century ago, the late Eric Lloyd, discussing acute osteitis, pointed out the difficulties in comparing reports from different centres:

> "There is no hard and fast line between what is acute and what is subacute or even chronic. At one end of the scale is the author who includes such smouldering fires as osteomyelitis of the jaw and at the other is he who almost comes to believe that no case is acute unless the patient dies! It is not a question of dishonesty but of ignorance." (Lloyd 1932.)

I cannot be sure that my own standard of "benign" and "severe" has remained constant during the past ten years. In my own mind I feel sure that any of the present 19 patients in the "severe" group might have died if antibiotics had not been available. There was in fact a 21% mortality. It would be almost impossible to compare them with cases from another centre.

Summary

Hæmatogenous osteitis in the newborn appears to be increasing. The causal organism is commonly a coagulase-positive staphylococcus resistant to penicillin in over 80% of cases.

41 cases of neonatal osteitis were treated in ten years. They have been divided into 22 "benign" cases and 19 "severe." This is essentially a personal classification. There were 4 deaths in the series.

Septicæmia in the newborn may present as pneumonia or as gastro-enteritis; and, if treatment is delayed or inadequate, pyæmic lesions may appear in any organ.

All but one of the "severe" cases were in children born in an institution. This may be associated with the reported increase in minor staphylococcal infections in maternity units.

The prolonged use of chlortetracycline (aureomycin) as advocated by Dennison and Macpherson (1952a) is now thought undesirable. A penicillin-streptomycin preparation is recommended; but, whichever antibiotic is used, treatment with it should be discontinued as soon as the blood infection appears to be controlled.

My thanks are due to my medical colleagues who diagnosed and referred many of the cases; to Dr. A. M. MacDonald and his staff of the hospital department of pathology; and to Dr. James Howie, regius professor of pathology in the University of Glasgow, for invaluable advice.

REFERENCES

Barber, M., Wilson, B. D. R., Rippon, J. E., Williams, R. E. O. (1953) *J. Obstet. Gynæc., Brit. Emp.* **60**, 476.
Capon, N. B. (1955) *Brit. med. J.* i, 803.
Cass, J. M. (1940) *Arch. Dis. Childh.* **15**, 55.
Corner, G. W. jun., Kistner, R. W., Wall, R. L. (1951) *Amer. J. Obstet. Gynec.* **62**, 1086.
Dennison, W. M., Macpherson, D. A. (1952a) *Arch. Dis. Childh.* **27**, 375.
— — (1952b) *Glasg. med. J.* **33**, 175.
Dillehunt, R. B. (1935) *Surg. Gynec. Obstet.* **61**, 96.
Douglas, R. G., Stander, H. J. (1943) *Amer. J. Obstet. Gynec.* **46**, 1.
Forfar, J. O., Maccabe, A. F., Balf, C. L., Wright, H. A., Gould, J. C. (1955) *Lancet*, i, 485.
Fraser, J. (1924) *Brit. med. J.* ii, 605.
Greengard, J. (1946) *Med. Clin. N. Amer.* **30**, 135.
Hay, P., McKenzie, P. (1954) *Lancet*, i, 945.
Lloyd, E. I. (1932) *Proc. R. Soc. Med.* (Sect. Surg.) **25**, 519.
Nelson, M. G. (1952) *Ulster med. J.* **21**, 36.
Potter, C. M. C. (1954) *J. Bone Jt Surg.* **36B**, 578.
Stone, S. (1942) *Amer. J. Dis. Child.* **64**, 680.
Thomson, J., Lewis, I. C. (1950) *Arch. Dis. Childh.* **25**, 273.
White, M., Dennison, W. M. (1952) *J. Bone Jt Surg.* **34B**, 608.

ANTICOAGULANT THERAPY

DETERMINATION OF MAINTENANCE DOSAGE

D. G. FERRIMAN
D.M. Oxfd, M.R.C.P.
PHYSICIAN

E. M. R. TILL
M.B. Lond.
REGISTRAR

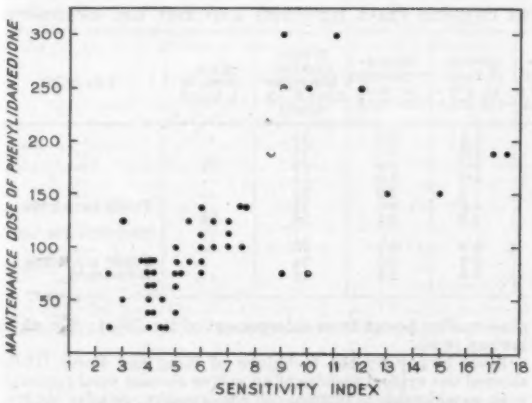
NORTH MIDDLESEX HOSPITAL

ONE method of prescribing anticoagulants employs a rule-of-thumb relationship with the daily prothrombin times. This is not very satisfactory, since patients' sensitivities to an anticoagulant vary considerably, and no single rule is applicable to all. A seemingly better method is based on the assumption that the desired prothrombin level can be maintained by a daily dose of anticoagulant which will remain constant for any particular individual, though it will vary widely from patient to patient (Bjerkelund 1953). This dose is discovered by considering the movement of the prothrombin level in relation to treatment throughout the course of the illness.

According to Bjerkelund (1953) and Toohey (1953), the daily maintenance dosage is related in some degree to the rapidity of fall in prothrombin levels during the initial stage of treatment, presumably because both depend on sensitivity to the anticoagulant. The present paper is concerned with the mathematical nature of this relationship, and its possible application to therapy.

Material and Method

52 patients have been studied, 39 with myocardial infarction, 4 with angina decubitus, and 9 with deep venous thrombosis (2 with pulmonary embolism).



Relation of sensitivity index to maintenance dose of phenylindanedione.

Phenylindanedione has been used exclusively. Dosage, except in a few early cases, has been 50 mg. six-hourly during the first twenty-four hours, and 50 mg. twelve-hourly during the second twenty-four hours. A prothrombin index

$$\frac{\text{Control prothrombin time}}{\text{Patient's prothrombin time}} \times 100$$

has been obtained daily, prothrombin times being measured by Quick's one-stage method. The prothrombin index at the end of approximately forty-eight hours has been noted, and a sensitivity index calculated by dividing the amount of anticoagulant used up to that time by the drop in the prothrombin index, the initial level in all cases being assumed as 100%.

Thereafter, anticoagulant has been prescribed daily to keep the prothrombin index as far as possible between 30% and 40%. At the close of treatment, the daily dose needed to keep the prothrombin index steady at this level has been noted.

The sensitivity indices have finally been plotted against the daily maintenance doses to produce the scattergram shown in the accompanying figure.

Discussion

The scattergram which emerged from this work shows a definite, if not strictly linear, relation between the daily dose of phenylindanedione needed to keep prothrombin indices at a constant level and the initial sensitivity to anticoagulant revealed by the sensitivity index. Quite apart from technical causes, a fundamental reason exists why this relation should not be mathematically exact. Sensitivity to an anticoagulant seems to be increased in patients who are seriously ill; maintenance doses which appear appropriate at first are not uncommonly found to be insufficient at some point during recovery from such illness. The present scattergram is based on the final maintenance dose.

Nevertheless, the relation has been found of some value in therapy, by assisting an earlier arrival at the appropriate maintenance dose. Cases are now divided into three groups with sensitivity indices respectively of 1–5, 6–8, and 9 upwards. The third day's dose in the three groups has been 50, 100, and 150 mg. respectively. Final adjustments are made in the light of subsequent changes in the prothrombin index. The keeping of a graph of daily prothrombin indices and doses of anticoagulant may be found visually helpful.

One modification of the above scheme has been found necessary. Doses of phenylindanedione much higher than 200 mg. daily are not now employed, since with such doses there seems to be a tendency to hæmorrhage at a higher prothrombin level. A final prothrombin index higher than 30–40% has to be accepted in such cases.

Summary

An index of sensitivity to an anticoagulant (phenylindanedione) has been determined by dividing the dose of anticoagulant employed in the first forty-eight hours of therapy by the fall in prothrombin index during the same time. It has been found that this sensitivity index is related in some degree to the daily dose of anticoagulant subsequently needed to keep the prothrombin index constant. The relationship has been found useful in predicting the daily dose of anticoagulant which will be required in maintenance therapy.

We are grateful to Dr. J. F. Heggie for laboratory facilities, and in particular to Miss A. Christie who has carried out most of the very large number of prothrombin estimations required. We wish to thank Miss I. M. Prentice of the Central Middlesex Hospital for the diagram.

REFERENCES

Bjerkelund, C. J. (1953) *Lancet*, i, 260.
Toohey, M. (1953) *Brit. med. J.* i, 650.

THE "L.E.-CELL" PHENOMENON IN ACTIVE CHRONIC VIRAL HEPATITIS

R. A. JOSKE *
M.D. Melb., M.R.A.C.P.
ASSOCIATE ASSISTANT PHYSICIAN, ROYAL MELBOURNE HOSPITAL

W. E. KING
M.D. Melb., M.R.C.P., F.R.A.C.P.
PHYSICIAN TO OUTPATIENTS, ROYAL MELBOURNE HOSPITAL

From the Clinical Research Unit of the Walter and Eliza Hall Institute of Medical Research and the Royal Melbourne Hospital, Victoria, Australia

THE introduction of the lupus erythematosus cell (L.E. cell) test by Hargraves and his colleagues in 1948 led to increased recognition of, and interest in, systemic or disseminated lupus erythematosus (D.L.E.). There is still debate, however, about the specificity of this test. Klemperer (1952), Dubois (1953), Hargraves (1954), and Harvey et al. (1954) regard the demonstration of L.E. cells as pathognomonic of D.L.E. On the other hand, there are reports of L.E. cells being demonstrated in penicillin sensitivity reactions (Gold 1951, Walsh and Zimmerman 1953), during the treatment of hypertension with hydralazine (Reinhardt and Waldron 1954, Shackman et al. 1954), in the newborn infant of a mother with D.L.E. (Bridge and Foley 1954), and in the blood of apparently normal persons (Butterworth 1953).

Though the nature of the L.E.-cell phenomenon is not yet fully determined, there is considerable evidence that it depends on an antigen-antibody mechanism. L.E. cells are often found in patients with a high serum-gamma-globulin, and the L.E. factor in serum seems to be an immunologically distinct gamma-globulin (Haserick and Lewis 1950, Hargraves 1954). The transplacental transmission (Bridge and Foley 1954) and occurrence of L.E. cells in acquired hæmolytic anæmia is consistent with this. Finally, Finch and his colleagues (1953) have produced L.E. cells by the action of rabbit anti-human-leucocyte antiserum on normal human leucocytes.

We report here the finding of L.E. cells in blood from two patients with active chronic hepatitis, probably of viral origin.

Case-report

A housewife, aged 37, was admitted to the Royal Melbourne Hospital on Oct. 26, 1954, with a two-month history of nausea, anorexia, abdominal pain, and jaundice. For ten years she had had recurrent severe headaches, often associated with vomiting, and considered by her physician to be migrainous. For eight years she had had some flatulent dyspepsia especially after fatty foods. Three years, and again eighteen months,

* Working with the aid of a grant from the National Health and Medical Research Council of Australia.

TABLE I—LABORATORY FINDINGS IN A PATIENT WITH ACTIVE CHRONIC VIRAL HEPATITIS AND THE L.E. SYNDROME

Date	Hb (g. per 100 ml.)	White cells (per c.mm.)	Serum-bilirubin (mg. per 100 ml.)	Cephalin flocculation	Serum-albumin (g. per 100 ml.)	Serum-globulin (g. per 100 ml.)	Serum-γ-globulin (g. per 100 ml.)	Serum alkaline phospha-tase(K.-A. units)	E.S.R. (mm. in 1 hour)	L.E. cells
Oct. 27, 1954 ..	13·0	7000	1·5	+ + +	3·7	5·1	2·8	16	..	..
Nov. 8, 1954 ..	10·0	..	0·2	+ + +	3·5	4·2	2·7	14	..	..
Nov. 22, 1954 ..	..	..	1·4	+ + +	3·3	4·1	3·6	19	79	..
Dec. 6, 1954 ..	12·6	..	3·6	+ + +	3·1	4·2	3·3	13	..	..
Dec. 20, 1954 ..	11·8	..	0·8	+ + +	3·3	5·3	3·9	13	..	..
Jan. 10, 1955 ..	10·3	5000	1·5	+ + +	3·4	4·7	3·1	17	..	Fairly numerous
Jan. 20, 1955 ..	..	..	0·6	+ + +	3·3	3·9	2·7	13	76	..
Jan. 24, 1955 ..	10·2	..	..	..	..	..	..	..	..	Moderate number
Feb. 8, 1955 ..	..	..	0·9	+ + +	3·8	2·9	2·5	18	..	..
March 16, 1955 ..	..	..	0·2	+ + +	3·7	3·3	2·4	14	..	Fairly numerous
April 20, 1955 ..	..	..	0·3	+ + +	3·7	3·3	2·7	18	..	Occasional

before admission she had had thrombophlebitis—in her right leg and arm respectively.

The present illness began when, after a severe attack of migraine, she noted that her urine had become dark and "frothy." Five days later she began to have jaundice. She had no pain but was anorexic.

Two weeks after the onset she was admitted to a hospital elsewhere. At this time she had "tightness" and discomfort in the epigastrium and under the right costal margin, aggravated by food and eased by belching. She also noticed for the first time "red blotches" (spider nævi) on the skin of her face and chest. In hospital her condition persisted unchanged with moderate jaundice, dark urine, and pale fæces. She did not respond to conservative therapy with a high-protein diet and added vitamins. A short course of corticotrophin (A.C.T.H.) was given for one week with some symptomatic relief, but was then discontinued because of severe upper abdominal discomfort. After six weeks she was transferred to the Royal Melbourne Hospital for further investigation. She had now lost 2 st. in weight.

She knew of no contact with a jaundiced person, but viral hepatitis was epidemic in the suburb where she lived for some months before the onset of her symptoms. She had worked in a munition factory with cordite, but on close questioning it appeared unlikely that her symptoms were due to such a poison.

On admission her temperature was 99°F, her pulse-rate 76 per min, her respiration-rate 16 per min., and her blood-pressure 120 80 mm. Hg. The liver edge was palpable 4 cm. below the right costal margin. The spleen was not palpable. No ascites was detected. Numerous spider nævi could be seen on her face, neck, and chest.

The diagnosis made was active chronic viral hepatitis, and this was consistent with the results of the laboratory investigations (table I).

Investigations

Hæmoglobin 13·0 g. per 100 ml.; white blood-cells 7000 per c.mm. with a normal differential count; Wassermann reaction negative; serum-bilirubin 1·5 mg. per 100 ml.; cephalin flocculation test strongly positive; serum-albumin 3·7 g., serum-globulin 5·1 g., serum-gamma-globulin 2·8 g., per 100 ml.; serum alkaline phosphatase 16 King-Armstrong units. Plain X-ray films of chest and liver area showed no abnormality (apart from enlargement of the liver); nor did a barium meal.

Liver biopsy by the technique of King and Perry (1948) showed the typical picture of an active chronic viral hepatitis with considerable polygonal-cell abnormality, cellular infiltration with lymphocytes and plasma-cells, and fibroblastic activity producing disruption of the normal lobular architecture.

Course in Hospital

After liver biopsy she developed a mild fever which responded to penicillin. Three weeks after admission her spleen became palpable. Since her condition failed to improve with bed rest and dietetic therapy, a course of tetracycline ('Achromycin') was begun, but after a few days she became drowsy and fœtor hepaticus was detected. Tetracycline was discontinued, her protein intake was reduced, and glutamic acid was given by mouth; and these measures restored her general condition.

Seven weeks after admission her clinical and biochemical condition was substantially the same as on admission. At this time, however, she began to complain of weakness, tiredness, and aches and pains in the muscles, and a few days later she had joint pains severe enough to reduce her to tears. These were unrelieved by salicylates or phenylbutazone, so further investigation was undertaken.

Liver-function tests still showed the picture of an active chronic viral hepatitis, but the gamma-globulin had risen to 3·1 g. per 100 ml.; Hæmoglobin was 10·3 g. per 100 ml.; white blood-cells 5000 per c.mm., with neutropenia and relative lymphocytosis; erythrocyte-sedimentation rate (Westergren), 62 mm. in one hour; Rose test negative; Coombs test negative. Examination by the method of Magath and Winkle (1952) showed fairly numerous L.E. cells present on Jan. 10, 1955, and again on Jan. 24 (table I).

For this reason oral cortisone was given, in an initial dose of 200 mg. daily, from Jan. 11. This produced a dramatic improvement in her arthralgia, and an increase in her sense of well-being. The dose was then reduced, but her joint pains recurred when a dose of less than 50 mg. daily was reached. She was discharged on Feb. 10, on a maintenance dose of 50 mg. daily.

She has been reviewed in the outpatient department at monthly intervals. On April 20 there was no clinical icterus;

TABLE II—SALIENT CLINICAL AND LABORATORY FINDINGS IN SEVEN PATIENTS WITH ACTIVE CHRONIC VIRAL HEPATITIS

Case no.	Age	Sex	Length of history (mos.)	E.S.R. (mm. in 1 hour)	Serum-bilirubin (mg. per 100 ml.)	Cephalin flocculation	Serum-albumin (g. per 100 ml.)	Serum-globulin (g. per 100 ml.)	Serum-γ-globulin (g. per 100 ml.)	Serum alkaline phosphatase (K.-A. units)	Hb	White cells (per c.mm.)	L.E. cells	Erythro-phagocytosis	Prior cortisone treatment
1	21	F	6	102	3·0	+ + +	2·4	4·6	3·8	32	13·0	9000	Yes	Yes	Nil
2	36	M	53	..	0·9	+ +	2·4	3·7	2·2	22	11·5	3000	No	No	50 mg. daily for 30 months
3	16	M	16	54	1·6	+ + +	3·1	4·6	4·2	23	11·9	4000	No	Moderate and tart cells	Nil
4	45	M	16	4	25·3	+ + +	3·3	3·5	2·2	35	13·9	20,000	No	Yes marked	50 mg. daily (oral) for 11 months
5	31	M	41	..	0·1	+ +	3·4	3·3	1·7	10	13·2	..	No	No	50 mg. daily (oral) for 22 months
6	16	M	24	..	2·0	+ + +	3·0	4·9	3·6	25	11·5	..	Tart cells only	No	50 mg. daily (oral) for 16 months
7	46	F	27	15	2·8	+	2·9	3·5	2·4	22	10·6	8000	No	No	75 mg. daily (oral) for 8 months

the liver edge was palpable 2 cm. below the right costal margin; the spleen was not palapable; the spider nævi persisted unchanged. Laboratory findings are shown in table I. On July 20 the physical findings were unchanged.

Further Investigation

A systematic search was made for L.E. cells in seven patients under observation or treatment for active chronic viral hepatitis. In all of them this diagnosis was supported by epidemiological, clinical, biochemical, and histological evidence. None provided any clinical evidence of arthralgia or the other common manifestations of D.L.E. Brief details of these cases and the results of the relevant laboratory investigations are shown in table II.

It is noteworthy that L.E. cells were demonstrated in one of these patients and erythrophagocytosis in three of them. We may recall that Leoni (1954) found L.E. cells in ascitic fluid from a patient with hepatic cirrhosis.

Discussion

There are three possible explanations of these findings: (1) that some of the patients were suffering from both chronic viral hepatitis and D.L.E.; (2) that the primary disease in them was D.L.E., with predominant hepatic manifestations; and (3) that the L.E.-cell phenomenon was in some fashion a result of a primary chronic hepatitis.

That the patients had two independent diseases is thought to be unlikely for two reasons. Neither D.L.E. nor chronic viral hepatitis are common diseases, and there is considerable positive evidence—epidemiological, clinical, and laboratory—for the diagnosis of chronic viral hepatitis, all showing in all respects the characteristic features of this disease (Saint et al. 1953).

Concerning the second possibility, though abnormal "liver" function tests, especially positive flocculation tests and hyperglobulinæmia, are frequent in D.L.E. (Joske and Stubbe 1955), these arise not from primary hepatic damage but from a more fundamental disturbance of protein metabolism in D.L.E. In our experience liver biopsies from cases of D.L.E. have not shown the gross changes observed in active chronic viral hepatitis. Nor do published reviews of D.L.E. lay stress on hepatic fibrosis and its sequelæ as part of the clinical picture of D.L.E. (Cohen and Cadman 1953, Dubois 1953, Gold and Gowing 1953, Soffer et al. 1954).

Hence we think that the primary lesion in these cases was active chronic viral hepatitis and that the L.E. phenomenon is in some way a result of this disease.

In active chronic viral hepatitis the characteristic biochemical finding is a hyperglobulinæmia affecting chiefly the gamma-globulin (antibody) fraction. Studies with isotopically labelled protein show this hyperglobulinæmia to be due largely to increased globulin production and not to decreased protein destruction (Havens et al. 1954). It is our present thesis that the L.E. cells and related immuno-hæmatological phenomena are a by-product of this excess gamma-globulin (antibody) production. The evidence suggesting that the L.E.-cell test depends upon an anti-leucocyte antibody has been quoted above.

Several other reported findings are relevant to this theme. The frequency of Coombs-positive acquired hæmolytic anæmia in D.L.E. has been emphasised by several workers (Dubois 1952, De Gruchy 1954, Joske and Stubbe 1955), and it is significant that antibodies to both erythrocytes and leucocytes are not infrequent in otherwise diverse diseases having in common only the features of hypergamma-globulinæmia and/or affection by the disease process of the antibody-producing cells. Thus hæmolytic anæmia in viral hepatitis has been reported by Hennemann et al. (1952), and also observed in our own series (Saint and Joske 1955). Hæmolytic anæmia occurs occasionally in lymphatic leukæmia but rarely in myeloid leukæmia (Rosenthal et al. 1955). Dausset has demonstrated leucagglutinins in chronic lymphatic (but not myeloid) leukæmia, D.L.E., and other granulopenic states (Dausset 1954, Dausset et al. 1954). Hæmolytic anæmia has also been observed in multiple myelomatosis, in which hyperglobulinæmia is frequent (Whitby and Britton 1950), and may complicate infectious mononucleosis (Berté 1951, Mermann 1952).

For these reasons we suggest that the L.E.-cell phenomenon, while characteristically occurring in D.L.E., has a more general significance in indicating the presence of auto-antibodies to leucocytes. In terms of the hypothesis of Burnet and Fenner (1949) it is evidence of a failure of the antibody-producing mechanism to "recognise" white-cell elements as self-constituents, thus allowing the production of antibody which can react with them. The phenomenon would have a similar significance to a positive Coombs test, which detects circulating antibodies to the patient's red cells. The L.E. cell, erythrophagocytosis, and a positive Coombs test may therefore all occur in diseases of or affecting the antibody-producing cells or characterised by greatly increased production of gamma-globulin, and the reports cited show they do. A further consequence of this hypothesis is that D.L.E. (and acquired hæmolytic anæmia) must be regarded not as a disease entity but as a syndrome. The diagnosis of D.L.E. is but the first step in the understanding of a patient, and should be followed by further investigation to attempt to define the ætiology of the syndrome. The necessity for this is already recognised in acquired hæmolytic anæmia.

On this hypothesis we suggest that the L.E. cell and related phenomena might be based either:

(1) on an abnormality of the antibody-producing mechanism resulting from diseases such as multiple myeloma, lymphatic leukæmia, and infectious mononucleosis; or
(2) on changes in red or white cells or their constituents by infective or chemical agents which modify their characteristic "self-markers" (Burnet and Fenner 1949), as in active chronic viral hepatitis or the L.E. syndrome occurring during hydralazine therapy.

Summary

A patient with active chronic viral hepatitis developed the lupus-erythematosus syndrome. L.E. cells were demonstrated in this patient and in one other who had active chronic viral hepatitis but no clinical manifestations of D.L.E.

It is suggested that the L.E.-cell phenomenon may result either from primary disease of the antibody-producing mechanism or, from changes in white cells or their constituents which modify their characteristic "self-markers."

Our thanks are due to Sir Macfarlane Burnet and Dr. Ian Wood for their advice during the preparation of this paper, and to our colleagues for their help in the laboratory investigations.

REFERENCES

Berté, S. J. (1951) *N.Y. St. J. Med.* **51**, 781.
Bridge, R. G., Foley, F. E. (1954) *Amer. J. med. Sci.* **227**, 1.
Burnet, F. M., Fenner, F. (1949) Production of Antibodies. Melbourne.
Butterworth, C. E. jun. (1953) *J. clin. Invest.* **32**, 558.
Cohen, H., Cadman, E. F. B. (1953) *Lancet*, ii, 305.
Dausset, J. (1954) *Sang*, **25**, 683.
— Nenna, A., Brecy, H. (1954) *Blood*, **9**, 696.
De Gruchy, G. C. (1954) *Aust. Ann. Med.* **3**, 106.
Dubois, E. L. (1952) *Amer. J. Med.* **12**, 197.
— (1953) *Arch. intern. Med.* **92**, 168.
Finch, S. C., Ross, J. F., Ebaugh, F. G. jun. (1953) *J. Lab. clin. Med.* **42**, 555.
Gold, S. (1951) *Lancet*, i, 268.
— Gowing, N. F. C. (1953) *Quart. J. Med.* **22**, 457.
Hargraves, M. M. (1954) *Advanc. intern. Med.* **6**, 133.
— Richmond, H., Morton, R. (1948) *Proc. Mayo Clin.* **23**, 25.
Harvey, A. McC., Shulman, L. E., Tumulty, P. A., Conley, C. L., Schoenrich, E. H. (1954) *Medicine*, **33**, 291.
Haserick, J. R., Lewis, L. A. (1950) *Blood*, **5**, 715.
Havens, W. P. jun., Dickensheets, J., Bierly, J. N., Eberhard, T. P. (1954) *J. Immunol.* **73**, 256.
Hennemann, H. H., Möller, H., Gillert, K. E. (1952) *Klin. Wschr.* **30**, 809.
Joske, R. A., Stubbe, J. L. (1955) Submitted for publication.

References continued overleaf

FIBROUS DYSPLASIA OF THE SKULL

N. AMELI
M.B., Ch.M. Birm., F.R.C.S.E.
ASSOCIATE PROFESSOR OF NEUROSURGERY IN THE UNIVERSITY OF TEHERAN, IRAN

IN 1937 Albright and his associates described a condition "characterised by osteitis fibrosa disseminata, areas of pigmentation and endocrine dysfunction, with precocious puberty in females." The osseous lesions, now known as fibrous dysplasia, have since been observed and reported by many workers.

Not infrequently the skull bones are involved; and occasionally the cranial lesion is the only manifestation of the disease. The involvement of the skull may give rise to signs and symptoms of a slowly growing intracranial space-occupying lesion; and, when the other manifestations of fibrous dysplasia are absent, many interesting problems arise for the neurosurgeon in diagnosis and treatment of these patients.

In this paper three cases are described. In two of them the skull was the only area involved and only one bone was affected (monostotic type). The third case was of the polyostotic variety.

Case-records

FIRST CASE

A girl, aged 12, was referred to me by Dr. Patvakanian. Three years before admission she began complaining of slight attacks of headache at irregular intervals. At least 12 months before admission her parents noticed that her left eye was more prominent than her right; this gradually became more so. 6 months later the patient realised that she was blind in her left eye. Recently the attacks of headaches had become more severe and more frequent.

Examination

She was alert and coöperative, with no disturbance of speech. There was no sign or history of sexual precocity, and no abnormal pigmentation. No bruit was audible on the surface of the skull. The left eye protruded considerably and could not be completely covered by the lids. The exophthalmos was directly forward, with no tilting of the eyeball. There was no visible pulsation. There was no perception of light by the left eye. The left fundus showed primary optic atrophy, and the right fundus marked papillœdema (Foster Kennedy syndrome). There was no defect in the field of vision of the right eye. On the left side the external ocular movements were grossly limited in all directions. There was no abnormality in the other cranial nerves and the extremities.

The blood-cells and erythrocyte-sedimentation rate were normal. The Wassermann reaction of the blood was negative. Casoni's test for hydatid was positive.

Radiography of the skull showed a circular linear calcification in the left temporal region as in case 2. There was no evidence of bone destruction. Angiography of the left side of the brain showed considerable upward displacement of the sylvian group of arteries. As hydatid disease is common in Iran, the preoperative diagnosis was a hydatid cyst in the left temporal lobe.

Operation

A vertical incision was made in the left temporal region, as for subtemporal decompression. After removal of the bone a greyish mass was seen external to the dura and apparently growing from the bone in the temporal region. The mass was not very hard and was rather vascular. It could be separated from the under surface of the dura. A piece was removed for biopsy (fig. 1).

Further operation was refused; and, as the family has left the country, no follow-up has been possible.

SECOND CASE

A boy, aged 15, referred to me by Dr. Saba, was admitted to the neurosurgical department of Pahlavi Hospital in April, 1951. For 18 months he had been having attacks of headache and giddiness. About a year before admission the right side of his face became paralysed; this came on suddenly, and his parents thought that he had had a stroke. At the same time he had diplopia, but this cleared up after a few weeks. Headache, occasional attacks of vomiting, and right facial paralysis continued. Twenty days before admission the patient gradually developed a tremor and weakness in the left arm and hand. Recently he had noticed some blurring of vision in his right eye.

Examination

His fundi showed severe bilateral papillœdema. There was no field defect to confrontation. There was complete lower-motor-neurone paralysis of the right side of the face. He was totally deaf on the right side. The boy had a constant, regular, uniform tremor of the left hand indistinguishable from the tremor seen in parkinsonism. Tonicity of the left arm was much increased and power diminished. The left leg was weaker than the right. The tendon reflexes were brisker on the left side than on the right. The abdominal reflexes were all present, and the plantar reflexes were flexor. There was no sensory disturbance.

Analysis of the urine and blood showed no abnormality. A Casoni test was negative.

Radiography of the skull showed a circular linear calcification in the right posterior temporal region, and there was irregular decalcification in the bone, suggesting cystic areas (fig. 2). The petrous portion of the bone showed much destruction.

Operation

Under local anæsthesia (1% procaine hydrochloride and adrenaline) a large bone flap was turned down in the right temporal region. The squamous part of the temporal bone was very thin in places, and its inner surface showed many ridges. A large hard greyish mass protruded from the under surface of the dura. When the mass was removed piecemeal, many small cystic cavities containing yellowish fluid were found. Although the tumour was in parts soft and friable, most of it was hard and gritty. At the periphery of the tumour small thin flakes of bone were found separating it from the dura. Where these pieces of bone were absent the tumour adhered to the dura. The petrous bone was eroded, forming small cavities. Although the upper and medial limits of the tumour were well defined, the under surface was irregular and occupied the cavities in the petrous bone. After removal of all the visible tumour tissue and curetting of the cavities in the petrous bone the wound was closed.

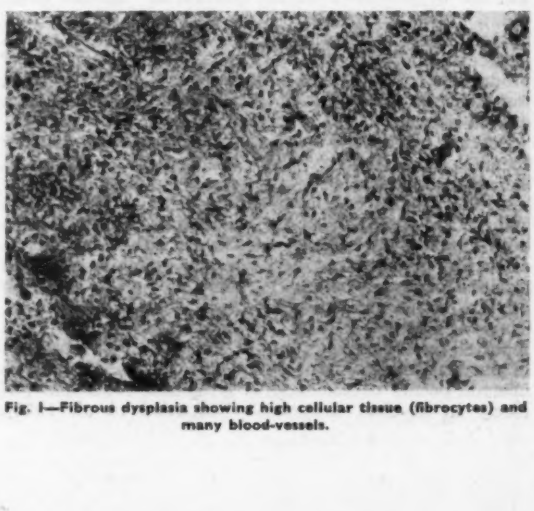


Fig. 1—Fibrous dysplasia showing high cellular tissue (fibrocytes) and many blood-vessels.

DR. JOSKE, DR. KING: REFERENCES—*continued*

King, W. E., Perry, J. W. (1948) *Med. J. Aust.* **1**, 697.
Klemperer, P. (1952) Pathology of Systemic Lupus Erythematosus in Progress in Fundamental Medicine. Philadelphia.
Leoni, A. (1954) *Minerva med., Torino*, **45**, 1022.
Magath, T. B., Winkle, V. (1952) *Amer. J. clin. Path.* **22**, 586.
Mermann, A. C. (1952) *U.S. Forces med. J.* **3**, 1551.
Reinhardt, D. J., Waldron, J. M. (1954) *J. Amer. med. Ass.* **155**, 1491.
Rosenthal, M. C., Pisciotta, A. V., Komninos, Z. D., Goldenberg, H., Dameshek, W. (1955) *Blood*, **10**, 197.
Saint, E. G., Joske, R. A. (1955) In the press.
— King, W. E., Joske, R. A., Finckh, E. S. (1953) *Aust. Ann. Med.* **2**, 113.
Shackman, N. H., Swiller, A. I., Morrison, M. (1954) *J. Amer. med. Ass.* **155**, 1492.
Soffer, L. J., Elster, S. K., and Hamerman, D. J. (1954) *Arch. intern. Med.* **93**, 503.
Walsh, J. R., Zimmerman, H. J. (1953) *Blood*, **8**, 65.
Whitby, L. E. H., Britton, C. J. C. (1950) Disorders of the Blood. London.

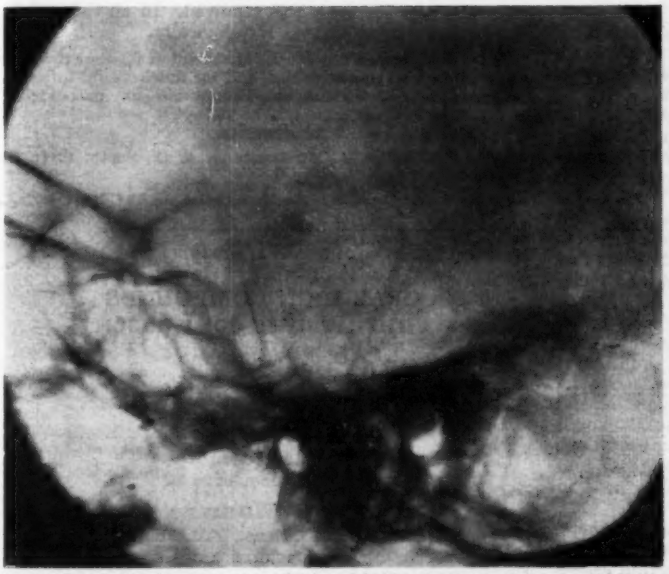


Fig. 2—Case 2, showing areas of rarefaction and ridges in temporal bone and thin line of calcification marking upper limit of tumour.

Histology

Osteitis fibrosa was found (fig. 3).

Progress

The tremor of the hand ceased soon after the operation; and the weakness of the left arm also cleared up. There has been no change in the facial paralysis and deafness. The patient was seen two years after the operation, with no sign of recurrence of the lesion.

THIRD CASE

A boy, aged 18, was referred to me by Dr. Armin. Since the age of 7 he had noticed a swelling on the left side of his forehead. This had gradually but very slowly increased. When he was 10 the mass ceased to grow; but at 13–14 it was again getting larger; and at the same time his left maxilla and left mandible gradually became more prominent. When he was 16 the mass stopped growing and had not increased since. The boy said that the mass on the forehead was at first soft but had become hard. He said he also had a small mass on the left side of his chest. There was no history of headache, visual disturbance, or sexual precocity.

Examination

There were bony masses on the left side of the face affecting the forehead, maxilla, and mandible (fig. 4), the right side being normal. The swellings were uniformly hard and not tender. There was moderate left exophthalmos. External ocular movements were normal. No abnormality was found in the central nervous system. A mass as big as a golf-ball was growing from the sixth rib on the left side.

Radiography of the affected bones showed calcified masses varying in density in different areas. There were no cysts.

Histology

In 1948, during an active phase of the lesion, a piece removed for biopsy showed osteitis fibrosa.

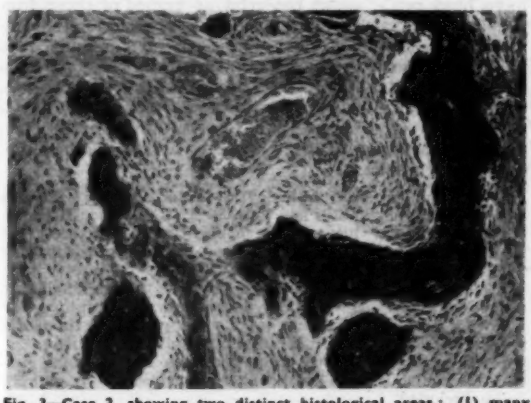


Fig. 3—Case 2, showing two distinct histological areas: (1) many fibrocytes surrounding fairly large blood-vessels; and (2) bone and cartilage.

Discussion

Fibrous dysplasia of bone is one of many conditions which were in the past diagnosed as osteitis fibrosa. Thanks to the work of Albright et al. (1937), Lichtenstein and Jaffe (1942), and others, it can now be regarded as an independent clinical entity.

Fibrous dysplasia is a disease of early life, and its course is often arrested at the completion of skeletal growth; but occasionally a quiescent growth may show signs of activity after some years (case 3).

Albright et al. (1937) suggest that either a neurological disturbance or an embryological defect is responsible. Unilateral lesions in the polyostotic type (case 3) support a neurological basis.

Trauma, humoral disturbance, and neurofibromatosis have been suggested as the cause by different workers; but so far no convincing hypothesis explains this interesting condition.

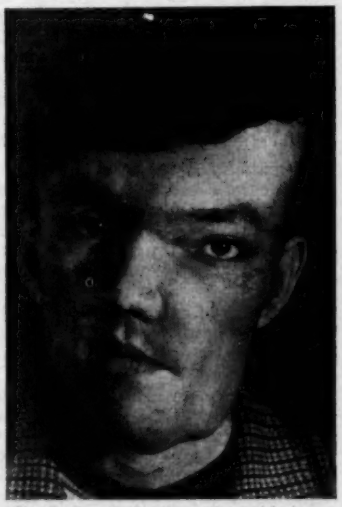


Fig. 4—Case 3, showing unilateral lesions.

Pathology

The tumour appears as a yellow or greyish-white mass. It is usually firm and occasionally has areas of cystic degeneration containing yellow or brownish fluid. Separating the tumour from the dura, flakes of bone are often seen, which are probably the remnants of the original bone expanded by the growth of the tumour. In the monostotic variety the bone which is the site of the lesion may not show any change externally except a slight smooth bulge (cases 1 and 2); but in the polyostotic variety gross disfigurement may result (case 3). Internally the bone is eroded with irregular depressions and cavities.

Histologically the mass is composed of fibrous connective tissue (fig. 4) which is either cellular or densely collagenous. Throughout the mass, trabeculæ of immature bone, or rarely cartilage, are seen. This new bone is most abundant at the periphery of the mass. The transition from the lesion to the normal skeletal tissue is abrupt. Multiple small cysts are occasionally seen in the tumour mass. The lesion is moderately vascular.

Clinical Aspects

The polyostotic variety of fibrous dysplasia has been fully described by Albright et al. (1937), Warrick (1949), and others. Lichtenstein and Jaffe (1942) collected published reports of 90 cases; only 20 of these, all in females, showed signs of precocious puberty. In 15 cases only one bone was affected. Schlumberger (1946) collected 67 published cases of the monostotic variety; in 14 of them bones of the skull were the site of the lesion: calvarium 5; maxilla 7; and mandible 2. Of the bones of the calvarium the frontal, parietal, temporal, and occipital bones have all been involved. The maxilla is most often involved. Falconer et al. (1942) suggested that some cases reported as leontiasis ossea are really examples of fibrous dysplasia (as in case 3).

The patients, usually adolescent, present with either signs of a slowly growing intracranial lesion or a mass growing externally from the bones of the skull. For this reason fibrous dysplasia of skull is often mistaken for a meningioma. Other symptoms and signs depend on the site of the lesion: in case 1 unilateral exophthalmos and blindness were the leading manifestations of the condition; in case 2 facial paralysis, deafness, and unilateral parkinsonism on the opposite side; and in case 3 unilateral facial disfigurement.

Ocular lesions have been reported by many workers. Davidoff (1951) found proptosis in 3 of his 5 patients with fibrous dysplasia. The tremor of the hand in case 2 is an unusual manifestation of an intracranial space-occupying lesion. Loss of hearing and facial pain were noted by Davidoff in 1 of his cases.

Radiology

The radiological appearances depend on the site of the lesion. In cases 1 and 2 shell-like calcification round the tumour mass was most striking; and in case 3 irregular destruction of bone and new bone formation in adjacent areas can be seen throughout the affected areas.

Radiologically the most important points can be summarised as irregular destruction of bone in some areas and calcification in others; thinning and expansion of the bone in some affected bones; and shell-like calcifications marking the limit of the tumour mass.

Differential Diagnosis

Monostotic fibrous dysplasia of the skull is often mistaken for a meningioma. Clinically the most important point is the patient's age; meningiomata, unlike fibrous dysplasia of the skull, are rarely seen before puberty. Angiography is very helpful in differential diagnosis between these two lesions. In meningioma vascularity of the tumour is striking, whereas fibrous dysplasia shows an avascular area. At operation the site of the tumour, which is always extradural, clarifies the situation.

In countries where hydatid disease is common, the linear calcification suggests hydatid cyst of the brain. The Casoni test and Weimberg reaction are not always conclusive. In cerebral hydatid cyst once the symptoms appear they progress very rapidly, but in fibrous dysplasia the tumour always grows very slowly.

Treatment

It is always advisable to operate if there is any interference with functions of the central nervous system.

Although it is often impossible to remove all the tumour tissues, in the monostotic variety operation may bring about permanent relief, because the lesion ceases to grow at puberty.

There is no known treatment for the polyostotic variety or for the endocrine dysfunction if present.

Summary

Three cases of fibrous dysplasia affecting the bones of the skull are reported. Two were monostotic with signs and symptoms of an intracranial space-occupying lesion.

In one case the mass was removed. In all three cases the lesions were examined histologically.

My thanks are due to Dr. L. M. Davidoff for first drawing my attention to this condition and for much useful information; and Dr. Armin and Dr. Rahmatian for pathological examinations.

REFERENCES

Albright, F., Butler, A. M., Hampton, A. O., Smith, P. (1937) *New Engl. J. Med.* **216**, 727.
Davidoff, L. M. (1951) Personal communication.
Falconer, M. A., Cope, C. L., Robb-Smith, A. H. T. (1942) *Quart. J. Med.* **11**, 121.
Lichtenstein, L., Jaffe, H. L. (1942) *Arch. Path.* **33**, 777.
Schlumberger, H. G. (1946) *Milit. Surg.* **99**, 504.
Warrick, C. K. (1949) *J. Bone Jt Surg.* **31B**, 175.

ORAL IRON COMPOUNDS
A THERAPEUTIC COMPARISON

D. J. O'SULLIVAN
M.B. N.U.I., M.R.C.P.
REGISTRAR

P. G. HIGGINS
M.B. Lond.
SENIOR HOUSE-OFFICER

JOHN F. WILKINSON
M.D., M.Sc., Ph.D. Manc., F.R.C.P., F.R.I.C.
CONSULTANT PHYSICIAN AND DIRECTOR

DEPARTMENT OF HÆMATOLOGY, MANCHESTER ROYAL INFIRMARY

SINCE Blaud showed, in 1832, that his preparation of iron, in adequate dosage was an effective remedy for chlorosis in young women, many other preparations have been tried in the treatment of hypochromic anæmia. In general it has been thought that the best preparations are those containing iron in the divalent (ferrous) form; but ferric preparations such as ferri et ammon. cit., have had their advocates. Again some workers have insisted on high dosage of iron, while others have been satisfied with much smaller amounts.

In the past few years organic iron preparations, such as salts of organic acids and chelate types, have been introduced and strongly recommended for the treatment of iron-deficiency anæmias, and it is clearly desirable that their advantages should be tested by direct comparison of their effects with those of the inorganic iron salts. For the purposes of such a test we decided not to make use of our previous records but to start a new series of comparable cases.

A review of medical and commercial reports made it clear that certain criteria and limitations were essential for any fair assessment. Many dogmatic statements have been made about the relative values of these iron preparations, usually after trials in mildly and moderately anæmic pregnant women; but their significance is much diminished by the fact that many of these patients improve spontaneously and rapidly after parturition. The severe hypochromic microcytic anæmias, which would give more impressive results, have rarely been used in previous studies. In our own trial we used the following criteria:

(1) A hypochromic microcytic iron-deficiency anæmia with hæmoglobin values less than 80% (12·0 g. per 100 ml.), mean corpuscular hæmoglobin concentration (M.C.H.C.) less than 30%, and the hæmatogram and myelogram compatible with a diagnosis of iron deficiency.

(2) Freedom from complications such as malignant disease and other conditions which may interfere with hæmatopoiesis.

(3) All iron preparations used were given in the same standard dose in terms of milligrammes of metallic iron.

(4) Comparable groups of patients as regards age, sex, and hæmoglobin level were taken, anæmias of pregnancy being excluded.

(5) The duration of therapy was fixed by certain well-defined limits (see below).

TABLE I—DISTRIBUTION OF CASES ACCORDING TO INITIAL HÆMOGLOBIN LEVEL AND OCCURRENCE OF KNOWN BLOOD-LOSS

Initial Hb %	Ferric hydroxide	Ferrous gluconate	Ferrous succinate	Ferrous sulphate
31–40	1 + (1)	1 + (1)	1 + (1)	1 + (1)
41–50	2 + (1)	2 + (1)	2 + (1)	2 + (1)
51–60	4 + (1)	4 + (1)	4 + (1)	4 + (1)
61–70	5 + (1)	5 + (1)	5 + (1)	5 + (1)
71–80	3 + (1)	3 + (1)	3 + (1)	3 + (1)
Total no. of cases	15 + (5) = 20	15 + (5) = 20	15 + (5) = 20	15 + (5) = 20

Patients with known blood-loss outside parentheses.
Patients without known blood-loss in parentheses.
100 % Hb = 14·8 g. per 100 ml.

Methods of Study

Four compounds were compared—two inorganic (ferrous sulphate and ferric hydroxide) and two organic (ferrous succinate and ferrous gluconate). The compounds were so presented that each patient received 210 mg. of metallic iron daily, in three divided doses of 70 mg. each, in tablet form, taken after meals. No ascorbic acid or other vitamin supplements were given; there was no clinical evidence of vitamin deficiency in any of the cases studied.

Eighty patients with hypochromic anæmia who responded to oral iron without severe side-effects (see below) were studied. Of these, sixty were known to have lost some blood, while in twenty no such loss had been detected. In most of the sixty the loss was menstrual, sometimes amounting to moderate menorrhagia. In one patient it was due to slight bleeding from a hiatus hernia, and in another to slight but long-standing bleeding from hæmorrhoids. The cases of apparently equal blood-loss were distributed equally between the four groups treated with the iron compounds; but it was appreciated that assessment of blood-loss could at best be only approximate. The patients were divided into two main groups—those with blood-loss and those apparently without it—and these were subdivided according to the initial hæmoglobin level (table I).

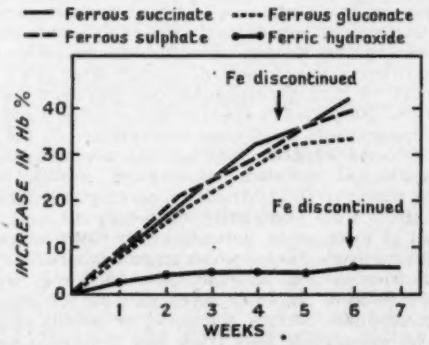
In all the patients gastric acidity was investigated by fractional gastric analysis or by using the quininium test-meal (Conway and Meikle 1953). Although many workers consider that anacidity has little or no effect on the absorption of iron in therapeutic doses (Fowler and Barer 1937), and that the addition of hydrochloric acid in therapeutic doses does not affect absorption, dilute hydrochloric acid was given to all achlorhydric patients so as to minimise any possible differences.

In every patient the hæmoglobin, red-cell count, colour-index, and M.C.H.C. were estimated, and the serum-iron level was determined by the thiocyanate method (Brendstrup 1948). The patient was given the appropriate iron compound and seen at intervals of either a week or a fortnight, the hæmoglobin and number of red cells being estimated at each visit. The test preparation was continued for 42 days unless the hæmoglobin increased to more than 90% (13·3 g. per 100 ml.) before this. A week after therapy had been discontinued the hæmoglobin, red cells, colour-index, M.C.H.C., and serum-iron level were estimated again. Every precaution was taken to see that the patients took their tablets regularly and that no tonics or other medicines that might contain iron were taken. 7 patients did not respond to any of the oral iron preparations under trial; these are considered later but have been omitted from the comparative figures. Any patient who did not respond to one preparation but subsequently responded to another preparation was included.

Results

The increase in hæmoglobin is shown as a graph (see figure) in which the average weekly increase from the initial values obtained in all the patients on each treatment is plotted against the number of weeks during which the treatment was given; and in table II, which shows the average daily increase in hæmoglobin calculated from the first day of treatment to the day of the maximum increase.

The graph method is probably the more accurate and informative method of assessing the therapeutic value of a compound, because the influence of the duration of treatment on the result can be better appreciated; but in the present investigation the average durations of treatment for each effective compound turned out to be so close together (33 days for ferrous gluconate, 31 for ferrous succinate, and 30·5 for ferrous sulphate) that for purposes of simplicity an average period of 31·5 days is given on the graph. As can be seen from the graph, the curves of ferrous succinate and ferrous sulphate run very close together, the former achieving a maximal increase of 40% (5·9 g. per 100 ml.) hæmoglobin in 42 days, whereas ferrous sulphate brought about an increase of 37·5% (5·5 g. per 100 ml.) in the same time. With ferrous gluconate the curve was only a little less satisfactory, the average weekly increase being always a little less than that achieved with the other two compounds and the maximum increase being 31·15% (4·56 g. per 100 ml.) in 42 days. Table II shows that here a comparable result is obtained—the daily increase



Weekly increases in Hb % during treatment with four oral iron compounds.

in hæmoglobin with ferrous succinate being 1·25%, with ferrous sulphate 1·22%, and with ferrous gluconate 1·12%. All three compounds in this dosage may be regarded as effective in that they will bring about an increase in hæmoglobin of more than 1% per day. The graph (see figure) shows that at no time was the average total increase in hæmoglobin greater than 4% when ferric hydroxide was used in this dosage, though it was continued for 42 days in all cases. The table shows that the mean daily hæmoglobin increase was only 0·12%.

The coefficients of utilisation (based on the fact that 25 mg. of elemental iron absorbed represents an

TABLE II—AVERAGE RESULTS WITH DIFFERENT IRON COMPOUNDS

Iron compound	Average duration of treatment (days)	Mean daily rise of Hb %	Utilisation coefficient	Mean initial M.C.H.C.	Mean final M.C.H.C.	Mean rise in M.C.H.C.	Mean initial serum Fe	Mean final serum Fe	% rise in serum Fe
Ferric hydroxide	42·0	0·12	1·23	26·05	26·3	0·25	51·3	52·2	1·17
Ferrous gluconate	33·0	1·12	11·36	26·82	30·1	3·27	43·8	73·3	67·35
Ferrous sulphate	30·5	1·22	14·40	27·0	30·53	3·54	48·0	72·0	50·0
Ferrous succinate	31·0	1·25	15·38	26·5	30·9	4·4	47·7	69·0	44·65

increase of 1% in hæmoglobin) were 15·38 for ferrous succinate, 14·40 for ferrous sulphate, 11·36 for ferrous gluconate, and 1·23 for ferric hydroxide (table II), the figures naturally corresponding to the increases in hæmoglobin shown in the graph. The mean increases in M.C.H.C. of 4·4 for ferrous succinate, 3·5 for ferrous sulphate, 3·27 for ferrous gluconate, and 0·25 for ferric hydroxide also correspond to the figures obtained from the increase in hæmoglobin, and it is only when the serum-iron levels are studied that a difference in the "order of merit" is seen. Here it will be noted that the percentage rise in serum-iron level was highest (67·35%) with ferrous gluconate, the figures for ferrous sulphate, ferrous succinate, and ferric hydroxide being 50%, 44·6%, and 1·17% respectively. We have found, however, that both in this review and in a much larger series of patients not included here, the M.C.H.C. is a much more reliable (and much simpler) method of assessing both degree of iron deficiency and response to therapy than is the serum-iron level.

Patients Intolerant and Refractory to Oral Iron

Intolerance of one or other compound was observed in five patients, but in none was the patient intolerant of all three effective compounds. Thus three patients out of twenty-three (13%) were intolerant of ferrous sulphate, but each of these tolerated ferrous gluconate well. One patient out of twenty-five (4%) was intolerant of ferrous gluconate but tolerated ferrous succinate; similarly one patient out of twenty-five (4%) was intolerant of ferrous succinate but tolerated ferrous gluconate. No patient was intolerant of ferric hydroxide in the dosage used. In all cases intolerance took the form of nausea and vomiting; in no case was diarrhœa or constipation of sufficient severity to warrant withdrawing therapy. Of eighty-nine cases originally included seven (8%) were completely refractory to oral iron. In each of these seven patients every effort was made to exclude organic disease which might impair absorption or utilisation of iron, and they responded very well to intravenous iron. In these seven patients refractory to ferrous succinate, ferrous gluconate, or ferrous sulphate the other compounds were tried, and in no case did the patient respond to one compound and not to another.

Discussion

At first sight the most striking feature about the results is the almost complete lack of response to ferric hydroxide. When it is remembered, however, that the normal therapeutic dose of this preparation contains 1200–2400 mg. of elemental iron per day, whereas we were using only 210 mg. of iron, the lack of response to such comparatively small doses is not surprising.

Tables I and II and the figure show that there is little difference in the effectiveness of the three compounds which proved satisfactory—i.e., ferrous succinate, ferrous sulphate, and ferrous gluconate. Whatever slight differences there are favour ferrous succinate and ferrous sulphate rather than ferrous gluconate. The result is surprising in view of Haler's (1952) paper and the vast amount of trade literature that has accumulated on the subject but shows how different may be the results in different therapeutic comparisons of the same substance, depending on the methods employed. Haler used a somewhat similar dose of ferrous sulphate and a much smaller dose of ferrous gluconate, with the result that the utilisation coefficient of the latter tended to gain. Also the ferrous-gluconate preparation used by Haler contained, among other supplements, ascorbic acid, which increases appreciably the absorption of iron (Moore 1955), whereas in the sulphate group vitamin supplements were given only "where vitamin deficiency appeared likely."

Much of the commercial literature, which claims such notable differences between the organic iron preparations and ferrous sulphate, bases these claims on still less convincing statistics. In one series reported, an average daily increase in hæmoglobin of 1·43% was claimed for ferrous succinate, and 0·85% for ferrous sulphate, the utilisation coefficients being 41·06 and 14·16 respectively. Closer analysis of the figures, however, shows that in the case of ferrous succinate 105 mg. of available iron was given daily for 24 days (a total of 2604 mg.) whereas in the case of ferrous sulphate 180 mg. of available iron was given daily for 42 days (a total of 7568 mg.). The basic unsoundness of comparing such different dosages given for such different lengths of time will be apparent, and the uselessness of comparing figures so obtained is evident.

Gatenby and Lillie (1955) compare the responses of two series of pregnant women—one series taking ferrous sulphate, and the other ferrous gluconate—and find that the response in those who tolerate the compounds is not appreciably different. Here again, the fundamental mistake is made of saying that the dosage is the same, whereas in fact what is meant is that the number of tablets taken is the same.

Gillhespy (1955), who investigated the results of the treatment of hypochromic anæmia with ferrous succinate in doses of 105 mg. of elemental iron daily, found an average hæmoglobin increase of 1·2% daily—i.e., a figure closely approximating to the results of the present investigation. It seems probable that smaller doses of ferrous gluconate and ferrous succinate are equally, or almost equally, effective; but there is reason to believe (Reznikoff 1940) that the same argument can also be used for ferrous sulphate. (We have not, in this investigation, attempted using smaller doses of ferrous sulphate.)

Since there seems to be little difference in effectiveness between the organic iron compounds and ferrous sulphate, it remains to be considered what advantages there are in using the newer organic preparations. It is unlikely that they will be effective in cases which are refractory to ferrous sulphate, but their advantage may be in the diminished incidence of symptoms of intolerance which attends their use. Although the series is not large, we have found from wider experience that the figure of 13% is a fair one in assessing the number of cases intolerant to ferrous sulphate in the doses we used. The figure is considerably lower than most of the recent assessments suggest.

Gatenby and Lillie (1955) found that only 46% of pregnant women could tolerate ferrous sulphate well. Benstead and Theobald (1952) also noted a high incidence of intolerance to ferrous sulphate in pregnancy hypochromic anæmias. Haler (1953) stated that ferrous sulphate is tolerated only by a relatively small proportion of the patients for whom it is prescribed, and other workers estimate the proportion of intolerant cases at about a third (*Lancet* 1954).

It should be remembered in the first place that intolerance of oral iron is much more common in pregnancy than at any other time, and that most of these workers used very much larger doses of ferrous sulphate than we do; and there is little doubt that the incidence of intolerance varies directly with the dosage. In this respect, since ferrous sulphate in doses of 210 mg. of elemental iron daily brings about a very adequate hæmatological response, with only a small proportion of patients showing intolerance; and, since we have failed to show that patients who do not respond to this dosage will respond to any other oral compounds of iron, we feel that there is much to be said in favour of the routine use of ferrous sulphate in approximately the dosage we used—i.e., 210 mg. of elemental iron daily, corresponding roughly to 0·6 g. of ferrous sulphate daily.

The use of larger doses of ferrous sulphate—e.g., up to 2 g. of ferrous sulphate, or 720 mg. of elemental iron, daily, as recommended by Whitby and Britton (1953)—dates from the time when iron by mouth was the only practical means, apart from transfusion, of treating hypochromic anæmia. However, since the introduction (Nissim 1947, Slack and Wilkinson 1950) of a stable and relatively non-toxic intravenous preparation, and with the subsequent development of a reliable intramuscular preparation of iron, the treatment of cases resistant to oral iron has few difficulties either in hospital or in general practice. It seems that smaller doses of ferrous sulphate with a smaller incidence of intolerant patients should be effective. The relatively small proportion of patients who are intolerant to these smaller doses should then be tried on one or other of the organic iron preparations; and if they are still intolerant of them parenteral therapy should be substituted.

Although the lower incidence of intolerance in patients receiving these organic iron preparations is an advantage, nevertheless the variations in cost and the greater expense of many of these preparations make their routine prescription at present a matter for thought. It is therefore of interest to consider this aspect of cost.

Our chief pharmacist, Mr. J. B. Lloyd, has kindly worked out for us the approximate cost of these preparations, when prescribed on E.C.10, at the current rates. From our figures given above, the treatment of patients with iron-deficiency hypochromic anæmia with 210 mg. of elemental iron daily for 30 days costs with ferrous sulphate 2*s.* 6*d.*, with ferrous gluconate 7*s.* 6*d.*, and with ferrous succinate 11*s.* 6*d.* Since there is practically no difference in the efficacy of these three preparations given in equivalent dosage, it is clear that some further readjustment in cost will be necessary to justify the use of the two latter preparations, except in very few cases. There is little doubt that, because of their relatively non-irritating properties, however, they do represent an alternative in the therapeutics of hypochromic anæmia.

Summary

A therapeutic trial was made of four commonly used oral iron preparations—ferric hydroxide, ferrous sulphate, ferrous succinate, and ferrous gluconate—in doses of 210 mg. of elemental iron given daily to eighty patients. Ferric hydroxide in the small daily dose given was unsatisfactory, but the three other preparations produced almost equal and satisfactory hæmatological responses.

Patients refractory to one oral preparation were refractory to all but responded to parenteral iron.

Intolerance was observed after ferrous sulphate in 13%, and after ferrous succinate and gluconate in 4% of patients.

Ferrous sulphate is effective in smaller doses (210 mg. daily) than are in general use at present.

The relative costs of treating hypochromic anæmias with these ferrous salts in equivalent dosage are compared. Ferrous sulphate is much cheaper than the others and equally efficacious. It maintains its position as a satisfactory therapeutic agent.

REFERENCES

Benstead, N., Theobald, G. W. (1952) *Brit. med. J.* i, 407.
Blaud, P. (1832) *Rev. méd. franç. étrang.* **1**, 357.
Brendstrup, P. (1948) *Ugeskr. Laeg.* **110**, 945.
Conway, H., Meikle, R. W. (1953) *Brit. med. J.* ii, 1019.
Fowler, W. M., Barer, A. P. (1937) *Arch. intern. Med.* **59**, 561.
Gatenby, P. B. B., Lillie, E. W. (1955) *Lancet*, i, 740.
Gillhespy, R. O. (1955) *Med. Illus.* **9**, 147.
Haler, D. (1952) *Brit. med. J.* ii, 1241.
— (1953) *Med. Pr.* March 11, p. 234.
Lancet (1954) ii, 954.
Moore, C. V. (1955) *Amer. J. clin. Nutr.* **3**, 3.
Nissim, J. A. (1947) *Lancet*, ii, 49.
Reznikoff, P. (1940) *Amer. med. Ass.* **114**, 2213.
Slack, H. G. B., Wilkinson, J. F. (1949) *Lancet*, i, 11.
Whitby, L. E. H., Britton, C. J. C. (1953) Disorders of the Blood. 7th ed., London; p. 227.

RUPTURE OF THE STOMACH COMPLICATING GASTRIC HÆMORRHAGE

D. E. BOLT
M.B. Brist., F.R.C.S.
SURGICAL REGISTRAR

W. B. HENNESSY
M.B. Sydney, M.R.C.P.
HOUSE-PHYSICIAN

WEST MIDDLESEX HOSPITAL, ISLEWORTH

A CONSIDERABLE number of cases of spontaneous rupture of the stomach has been reported. Majone (1948) collected 64 cases, but none of these was associated with intragastric hæmorrhage. In most recorded cases the rupture has been due to gross gaseous distension, often though not always following an excessive meal (Hillemand et al. 1947, Leger and Maës 1947, Chipail et al. 1948, Ladkin and Davies 1948).

In none of the cases reported has any local lesion been found which would account for the actual tear or slit in the stomach wall; but in some there was associated disease elsewhere in the stomach or duodenum.

Rejthar (1952) reported spontaneous rupture of the stomach in a woman of 67, who survived. She had pyloric stenosis due to a chronic gastric ulcer, and had had persistent almost unproductive vomiting for two days. At operation there was a 1-inch slit near the cardia fairly close to the lesser curvature.

Greene and Gose (1953) reported perforation of the stomach in a 13-day-old male infant who had associated atresia of the duodenum.

So far as we are aware, rupture of the stomach complicating gastric hæmorrhage has not hitherto been described.

Case-records

Case 1.—Mrs. A, aged 56, was admitted to hospital on Dec. 8, 1954, with a history of anorexia, occasional vomiting, and loss of weight for a year and of pain in the back for a month. For three weeks she had been in bed because of extreme weakness, and for three days she had had melæna. Apart from pallor, there were no abnormal physical signs, and her hæmoglobin was 6·9 g. per 100 ml. (47%).

After blood-transfusion (3 pints) she continued to pass tarry stools. On Dec. 14 transfusion was resumed and laparotomy with probable gastrectomy was decided upon. When the patient was being moved to the theatre she suddenly collapsed and had a considerable hæmatemesis—her first. Operation was postponed and transfusion continued. At this time she complained of mild abdominal pain, and gradually increasing abdominal distension was noted.

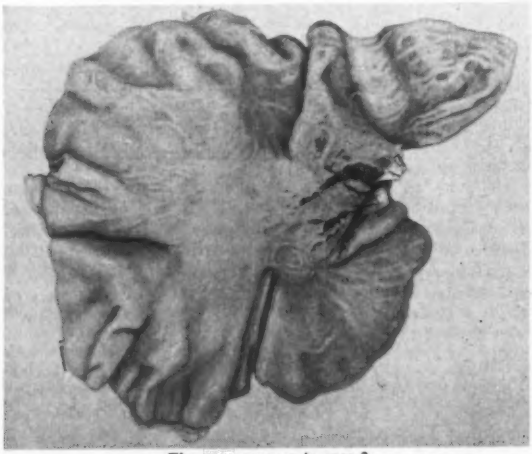
When a total of 7 pints of blood had been given *laparotomy* was undertaken. Under a bilateral intercostal and splanchnic block the abdomen was opened through an upper midline incision. The peritoneal cavity contained much liquid and clotted blood (some dark, some bright red). Exploration showed a large rent in the anterior wall of the stomach, through which a very large posterior gastric ulcer could be felt. Despite continued transfusion the patient's general state did not permit any further surgical procedure and the abdomen was closed. She died shortly after return to the ward.

At necropsy, thirty-six hours after death, the rent in the stomach was found to be quite separate from the ulcer. It measured $1^1/_2 \times 2^1/_2$ in. and was situated in the anterior wall a little to the left of the incisura and rather nearer the greater than the lesser curvature. There was a very large, simple posterior gastric ulcer, measuring $1 \times 1^1/_2$ in., its base being formed by the body of the pancreas with erosion of the splenic artery.

Case 2.—Mrs. B, a widow, aged 74, was admitted to hospital on Dec. 19, 1954, following a small hæmatemesis and the passage of several tarry stools in the preceding twenty-four hours. A gastric ulcer had been treated medically ten years previously and she had since had slight bouts of epigastric discomfort at long intervals. For three weeks before admission she had suffered from persistent epigastric pain.

She was rather frail and moderately pale. Her blood-pressure was 130/75 mm. Hg and her hæmoglobin 9·1 g. per 100 ml. (61%).

Early on Dec. 20 her condition suddenly deteriorated, and over the next twelve hours she was given 3 pints of blood. There was temporary improvement, but on Dec. 21 she again collapsed, the blood-pressure being unrecordable. In the next four hours she received 5 pints of blood, but her condition never improved enough to allow laparotomy. Her abdomen gradually became very distended and she began violent retching in an effort to empty her stomach. At 3.35 P.M. on Dec. 21 she vomited 2 oz. of bright red blood, and at 4.0 P.M. she had a sudden massive hæmatemesis and died.



The torn mucosa in case 2

Necropsy was carried out eighteen hours after death. The stomach was grossly distended by red blood-clot. There were three shallow non-indurated oval ulcers near the lesser curve, one of which showed a prominent bleeding-point in the base. A series of tears was noted in the mucosa of the cardia, roughly parallel and converging on the œsophagus (see figure).

Comment

In many of the cases in the literature, the rupture was a linear split, close to the cardia, and commonly this has been associated with several further tears in the adjacent mucosa, resembling those seen in case 2.

In both the cases we have described there was massive gastric hæmorrhage, and at necropsy large quantities of blood-clot were still present in the stomach. As both patients had vomited repeatedly, it seems probable that the gastric rupture (case 1) and mucosal splitting (case 2) were induced by violent muscle contraction endeavouring to expel this clot. Possibly, indeed, this complication is attributable in part to liberal blood-transfusion, since without rapid replacement of blood a patient would hardly survive loss of a quantity of blood sufficient to precipitate rupture of the stomach.

The risk of rupture is increased by gastric distension; and in cases of hæmatemesis where massive transfusion is undertaken, a special watch should be kept for clinical evidence of such distension, which, if it develops, must be regarded as a further urgent indication for surgical intervention.

Our thanks are due to Dr. N. F. Coghill, Dr. R. P. K. Coe, and Mr. W. J. Ferguson for permission to publish these cases, and to Dr. A. C. Counsell for his help in elucidating the pathology.

REFERENCES

Chipail, G. G., Wassermann, L. Lazarovici, I. (1948) *Arch. Mal. App. dig.* **37**, 479.
Greene, W. W., Gose, D. F. (1953) *Amer. J. Dis. Child.* **85**, 47.
Hillemand, P., Leger, L., Renault (1947) *Bull. Soc. méd. Hóp. Paris*, **63**, 607.
Ladkin, R. G., Davies, J. N. P. (1948) *Brit. med. J.* i, 644.
Leger, L., Maës, J. (1947) *J. Chir., Paris*, **63**, 35.
Majone, P. (1948) *Rif. med.* **62**, 126.
Rejthar, R. (1952) *Brit. med. J.* ii, 324.

UNILATERAL DIGITAL-ARTERY THROMBOSIS

AN INDUSTRIAL ACCIDENT

STEWART H. HARRISON
F.R.C.S.E., L.D.S.

CONSULTANT PLASTIC SURGEON, MOUNT VERNON CENTRE FOR PLASTIC SURGERY AND THE WINDSOR GROUP OF HOSPITALS

THROMBOSIS of a digital artery from direct pressure, incurred by occupation, is either very rare or often goes unrecognised, for I have found no specific instance on record. It is an industrial accident, and in view of its medicolegal implications I should be interested to hear of other cases.

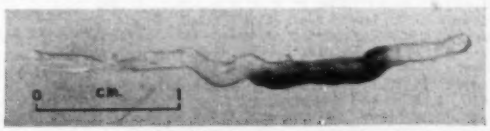
A man aged 53 was given the job of binding with plastic material half an inch wide. This material had to be stretched by hand and drawn taut during the process of tacking, and in this procedure the patient used the radial side of his left ring finger as the maximum pressure point or fulcrum. For 11 days, working 9 hours a day, there were no unusual symptoms; but on the 12th day he had severe pain in the finger radiating proximally, and noticed that the finger-tip had become white with loss of sensation. These symptoms were precipitated by cold and minor trauma, until it became necessary for him to discontinue working. Shortly after his initial symptoms he noticed a small lump on his finger which was tender on pressure.

He was referred to the hand clinic at the Industrial Health Centre in Slough. A small nodule was palpable under the skin on the radial side of the left ring finger in the line of the neurovascular bundle, and opposite the terminal inter-phalangeal joint. Pressure on this nodule caused pain which radiated proximally. Sensation was normal and there were no colour changes in the finger. There was no evidence of local injury and the hand appeared otherwise normal. The diagnosis of glomus tumour was made.

A month after his first symptoms, the skin of the flexor surface of the finger was turned back as a flap and the radial digital artery was exposed. It was found to have a hypertrophied lumen over a distance of 1·5 cm. with a thrombus in the centre segment (see figure). The involved area was excised and it was observed that the digital nerve was normal. After this operation his symptoms disappeared.

That a digital artery subjected to pressure, over a period, will thrombose is interesting; but that this thrombosis will give rise to radiating pain and reflex spasm of the opposite artery, sufficient to produce a Raynaud's type of syndrome, induces speculation on the nerve-supply of digital arteries and the neurovascular linkage in the finger.

The hypertrophied lumen of the artery implies a degree of intermittent trauma preceding the actual thrombosis, and this might cause spasm and temporary occlusion from cold, proceeding to complete occlusion of the vessel with a thrombus due to intimal damage. The symptoms strongly suggest neurovascular dysfunction of either local or proximal origin. The presence in the finger of a small tumour which was painful on pressure, and the localisation of the symptoms to one finger, would exclude a cause arising proximally, such as Raynaud's disease or vascular occlusion. Of the local causes, both the glomus tumour and partial division of a digital nerve could give rise to these symptoms; but there was no evidence of local injury to suggest that the nerve had been directly damaged. At no time, before operation, was the digital artery regarded as the only structure responsible for these symptoms.



The portion of the digital artery removed, showing the central thrombus.

Summary

A case of digital-artery thrombosis is described, caused by occupational trauma. This is a painful condition and prevented the patient from earning his living. Excision of the affected segment of the artery effected a cure and he was able to return to full work.

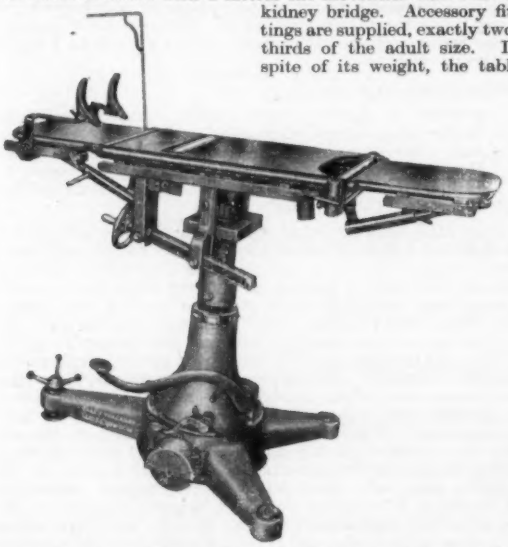
My thanks are due to Dr. A. Austin Eagger, medical director of the Industrial Health Service, Slough, for referring this case, and to Mr. P. J. Fisk, of the Canadian Red Cross Memorial Hospital photographic department, for the photograph.

New Inventions

A CHILD-SIZE OPERATING-TABLE

IN most hospitals in this country an adult-size operating-table is used for operations upon children. This is quite satisfactory for children over 10 years of age, but not for the younger ones. It is more especially the *width* of an adult-size table which makes extensive operations on small infants a back-breaking task.

Messrs. Chas. F. Thackray, of Leeds, have made to my specification a child-size table. The base is of the usual size and the height can be adjusted from 34 to 44 inches. The width is 12½ inches and the length 4 ft.: this can be further reduced by removing the head and foot flaps, both 1 ft. long. The table is fitted with a lateral tilt movement and built-in kidney bridge. Accessory fittings are supplied, exactly two-thirds of the adult size. In spite of its weight, the table



is moved very easily to make room for the adult-size table needed for older children.

For the last few years I have used these tables both at Alder Hey Children's Hospital and at the Royal Liverpool Children's Hospital and have found that they make operations on small children much less tiring for the surgeon and his assistant. The restricted field of operation is more directly under control, and operating while sitting down is facilitated. The table is particularly useful for small infants; but children up to about 6 years old can be operated upon without difficulty; for work in the lithotomy position children up to 10 or 12 are easily accommodated. It is very convenient for plastic surgical procedures, such as operations for hare-lip or cleft palate, and satisfactory for all types of endoscopic examinations, as well as thoracic and urological surgery. It is well constructed, beautifully finished, and easy to manipulate, and it has stood up well to very heavy use.

P. P. RICKHAM

Alder Hey Children's Hospital, Liverpool, 12

M.S. Lond., F.R.C.S., D.C.H. Pædiatric Surgeon

Reviews of Books

Man's Mastery of Malaria

PAUL F. RUSSELL, M.D., M.P.H., division of medicine and public health, Rockefeller Foundation. London: Oxford University Press. 1955. Pp. 308. 25*s*.

THE Heath-Clark bequest of the University of London has secured many distinguished lecturers, and Dr. Russell's contribution in 1953 was a notable one. Its subject is very much his own; his experience of malaria dates back many years, through his early and pioneer work of control by house-spray with the pyrethrum preparations in India, to his later advisory work which has taken him to most parts of the world where the disease prevails. The book is necessarily historical, its five sections dealing with the discoveries which have led to our understanding of the ætiology of malaria, its treatment and prophylaxis, some of its international aspects, and malaria and society, especially in relation to population pressure and malaria control. It is, of course, a stimulating story, and though it has been told before, it has never been told quite so well. The range of the author's research into the history of the subject matches the range of his practical experience; both have been easily assimilated by his capacious mind, and clothed in language which invites the reader. He ends on a robust note. It is too early as yet to assess fully the prospects of malaria control, but the indications are that it can be achieved; and Russell's view is that nothing should be allowed to stand in the way—certainly not vague fears of an increase in population pressure.

Medical Care for Tomorrow

MICHAEL M. DAVIS, PH.D. New York: Harper. London: Hamish Hamilton. 1955. Pp. 497. 52*s*.

SOME indication of the changes wrought by post-war legislation in this country is given by this book; for in Britain many of the matters discussed in it would come under the heading of "medical care for yesterday." The dust-cover describes it as "a definitive statement of the present status and future prospects of public and private medical services for the American people," and Dr. Davis, formerly a hospital administrator, approaches his subject from the point of view of those who receive and pay for medical care—i.e., the public. His chapter on the American Medical Association helps to explain why he has made no attempt to define or use the term "socialised medicine"; for "the arts of controversy have driven into this term invidious political connotations which cannot at present be removed by intellectual processes."

The first of the four parts of the book deals with the elements of medical services and especially with need, demand, and quality of service. Some remarkable facts emerge: thus, a little over a third of the 191,000 active doctors in the United States in 1949 (i.e., "before Korea") were working full-time for various organisations; and 40% of all the active medical graduates in the New York City area are said to be on full-time salary. It is also made clear that "America's health business is big business," for more than 2·5% of the total labour force makes its living within this field. He notes that "the active assistance . . . given by national nursing organisations to the efforts of Negro nurses to establish themselves professionally has had no parallel in medicine."

Part II discusses the evolution of organisations, beginning with the A.M.A., and continuing with hospitals, group practice, and public-health services. The public-health movement, Dr. Davis says, has missed a major opportunity during the past twenty years in failing to cultivate the understanding and coöperation of organised labour, especially in industrial hygiene. While it is pleasant to see the history of public responsibility for medical care in the United States traced back to Colonial times—indeed to the Elizabethan statute of 1601—it is nevertheless surprising to learn that samples of Elizabethan concepts can still be found, rendering tax-supported medical care casual and emergent. This part of the book brings out well the problem created by medical care for veterans, who constitute an eighth of the people (or a quarter if dependants are included). The statement that the Veterans Administration has the largest hospital system under one management in the world might, however, be challenged by

our own—though the answer will depend on what one means by management.

Part III is concerned with "evolution in economics," including health insurance, Blue Cross and Blue Shield, State medical society bureaux, and industrial plans, such as those of the steel and mine workers. Special mention is also made of the Health Insurance Plan of Greater New York, and of student health services. During the past twenty-five years more than half the U.S. population has come within some form of health insurance, and over 87 million people have some hospital insurance. The spectacular growth of voluntary health insurance has been a long step in changing the habits of the people from fee-per-service payments for medical care to group payment. A chapter on legislation and politics, 1911–52, discusses in detail the changing reactions of the medical profession, and others closely interested, to the trend towards State and national organisation of medical care. Dr. Davis was himself in the forefront of this battle. His description of the campaign methods of the A.M.A. is startling; but he believes that the massive efforts used to kill "socialised medicine" may in the end focus the attention of the American people on the need for medical care services.

In part IV he analyses the effects of the main currents of opinion over the past fifty years. After condemning fee-for-service as undesirable, he discusses State medicine and concludes that this possibility need not be taken seriously into consideration: the way of national health insurance, proceeding by stages, is a more favourable path of progress.

This is a well-written book, with a refreshing economy of words. For those interested in the American scene in general, and the organisation of medical care in particular, it comes into the category of necessary reading.

Biology of Bile Pigments

A Review of Chemistry and a Discussion of Analytical Methods. TORBEN K. WITH, M.D., specialist in internal medicine and clinical chemistry, Rigshospitalet, Copenhagen, Denmark. Copenhagen: Aene Frost-Hansen. 1954. Pp. 523. Kr. 50.

THIS exhaustive monograph on the bile pigments reviews published work on their chemical structure, methods for their determination, and their occurrence and importance in a number of animal species, including man. Much of the book deals with alterations in bile-pigment levels in body-fluids in diseases of the liver and of other systems of the body. While it is not recommended for general medical readers, the amount of information and the large number of references make it exceedingly useful as a reference work for chemical pathologists.

The English is very good and there are only a few instances of unusual phrasing. But the book is peculiarly assembled, being bound in thin cardboard and apparently cyclostyled, sometimes indistinctly on one side of foolscap-size sheets of poor-quality paper. As might be expected with such a format, the diagrams do not come out well.

Fluoroscopy in Diagnostic Roentgenology

OTTO DEUTSCHBERGER, M.D., assistant clinical professor of radiology, New York Medical College. Philadelphia and London: W. B. Saunders. 1955. Pp. 771. 154*s*.

Dr. Deutschberger has attempted to collect in one book all the essential knowledge about medical fluoroscopy. Had he written solely for radiologists, the result could have been very valuable; but he has tried also to provide a handbook for clinicians practising fluoroscopy. Parts of it are thus rather elementary and overloaded with information better set out in textbooks of radiology. Though he clearly states that bone diseases are the province of radiography, he uses fluoroscopy extensively for conditions in which radiography is essential, without explaining what gain is to be expected. In a work of this nature it seems a waste of 12 pages to describe the normal and abnormal fluoroscopic appearances of the cerebral ventricles: this section will tell radiologists nothing that they should not know, but might encourage clinicians to use fluoroscopy without adequate film control. Other sections suffer from the same defect, and help to make the book bulky. The bibliography is extensive and often very valuable in quoting original sources; but it contains, for example, no reference to the British work on flocculation of barium sulphate by freshly secreted mucus, or on the use of morphine in the examination of the stomach. Great stress is laid on the dangers of fluoroscopy, but one gets an impression that the author's aim is not to "burn" himself or the patient—which seems to imply a level of dosage that should never be approached. Insufficient stress is laid, on the other hand, on the genetic effects, which may never be clinically detectable in the patient or operator. Mention of these weaknesses should not, however, obscure the fact that the author has obviously had great experience of fluoroscopy, and that almost every reader will learn something from him.

Stratégie et tactique en chirurgie abdominale d'urgence

CHARLES CLAVEL, chirurgien des hôpitaux de Lyon. Paris: Masson. 1955. Pp. 580. Fr. 3800.

Professor Clavel has written the introduction to his attractive book in the form of a letter from the author to his pupil and "interne." He begins with the observation that difficult tasks are nowadays entrusted to young men—war, supersonic flying, command of submarines, acute abdominal emergencies, and love—and similar charming touches, which could only come from a French pen, are to be found throughout. An early chapter on the principles underlying the surgery of the acute abdomen displays the traditional and inexorable French logic. If the tone is somewhat didactic it does not offend, for it is obviously Professor Clavel's intention to approach his subject in a personal manner; indeed all the results to which he refers are taken from his own cases. The monograph abounds with advice; epigrammatic footnotes in heavy type appear at the bottom of many pages to provide guiding principles for the beginner. Some references are given, and almost all are to French papers.

Practical Medical Mycology

EDMUND L. KEENEY, M.D., F.A.C.P., formerly in charge of the mycological laboratory, and visiting physician and dispensary physician (allergy), Johns Hopkins Hospital, Baltimore. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1955. Pp. 145. 32*s*. 6*d*.

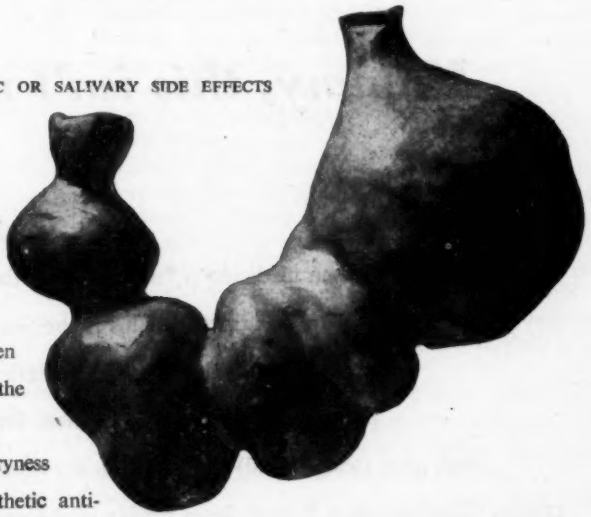
THIS little book, by an author whose name is well known to medical mycologists, is a model of concise and lucid description. In its small compass the entire field of human mycoses is surveyed and no important matter is omitted. In addition to diseases caused by fungus infections, two chapters have been included on airborne fungus spores as allergens and on the larger fungi in relation to toxicology. The subject is presented from the clinical viewpoint, with emphasis on symptoms, diagnosis, and treatment, which includes the most recent advances in the chemotherapy of the diseases. The history and epidemiology of the mycoses are dealt with very briefly, and their pathology and mycology only in so far as they affect diagnostic examinations. A novel feature is the graphic summary appended to each chapter, consisting of drawings illustrating points of importance such as the geographical distribution of the disease, the distribution of lesions in the body, and the chief items in the laboratory diagnosis.

The book, which is in the series of American Lectures in Internal Medicine, should prove useful to lecturers in general medicine as well as to practitioners and students.

Lectures on the Scientific Basis of Medicine (vol. III. London: The Athlone Press, University of London. 1955. Pp. 398. 35*s*.).—The rich basic medical scientific resources of British universities have been tapped to provide this further volume of lectures under the auspices of the British Postgraduate Medical Federation. Technical lectures by clinical specialists are often of little interest to other clinicians; but these lectures, being much more fundamental, escape such criticism. If the reader is an intelligent student of human biology he cannot fail to find ideas of interest in the chapters on biochemical genetics (J. B. S. Haldane), tissue repair (G. R. Cameron), hemispherectomy (E. A. Carmichael), pituitary growth hormone (F. G. Young), body-water control (G. M. Bull), and reactions to bacterial invasion (A. A. Miles)—to mention only a few topics in a stimulating record of progress in the basic sciences. Every lecture is an up-to-date account by an active investigator.

'WYOVIN'

ATROPINE-LIKE ACTION WITHOUT MYDRIATIC OR SALIVARY SIDE EFFECTS



TO CONTROL HYPERMOTILITY AND PAIN

in peptic ulcer

The use of atropine or belladonna to quieten gastric movements and "hunger pain" in the treatment of peptic ulcer has hitherto been complicated by blurring of vision and dryness of the mouth. 'WYOVIN', the new Synthetic anti-spasmodic, exhibits the smooth muscle relaxant effects of atropine to the full, *without visual or oral disturbance.*

Wyeth

10 mg. tablets available in bottles of 50 and 250.

John Wyeth & Brother Limited, Clifton House, Euston Road, London, N.W.1

'WYOVIN'
Trade Mark
DICYCLOMINE HYDROCHLORIDE

When the worst is over

Skill and care have won the battle, and the exhausted body is recuperating. It is *then* that Burgoyne's Tintara may mean the difference between long, dragging convalescence and a rapid recovery. For Tintara is not only beneficial but a really palatable burgundy. It contains no added alcohol or sugar and is a natural product of sun and ironstone soil.

Burgoyne's

TINTARA

(FERRUGINOUS) PRODUCE OF AUSTRALIA

P. B. BURGOYNE & CO. LTD., DOWGATE HILL, LONDON, E.C.4. TEL: CITY 1616

Mummy, this isn't medicine — it's nice!

When medicine is "nice to take" the doctor's work is considerably lightened. This is the secret of the success of Suspension Chloromycetin Palmitate. A pleasantly-flavoured preparation containing a tasteless derivative of Chloromycetin, each 4c.c. (teaspoonful) is therapeutically equivalent to 125mg. Chloromycetin. It hydrolyses readily in the gastro-intestinal tract, yielding the pure antibiotic. It can thus be easily administered both to infants and children and to those unable to take capsules, for the successful treatment of bacterial, viral or rickettsial infection.

SUSPENSION
CHLOROMYCETIN
PALMITATE

indicated in the treatment of
PERTUSSIS · INFANTILE GASTRO-ENTERITIS
LARYNGO-TRACHEO-BRONCHITIS
BACTERIAL PNEUMONIA · SURGICAL
INFECTIONS · PRIMARY ATYPICAL PNEUMONIA
MENINGITIS · SALMONELLOSIS
URINARY TRACT INFECTIONS
DYSENTERY · SEPTICAEMIA

PARKE, DAVIS & Company, Limited *Inc. U.S.A.* Hounslow, Middlesex Telephone: Hounslow 2361

113

THE LANCET
LONDON: SATURDAY, SEPT. 3, 1955

Bronchiectasis

IN the first account of bronchiectasis LAENNEC [1] included among his cases that of a 62-year-old woman who had had repeated hæmoptyses and had coughed up purulent sputum for almost fifty years. But this case was exceptional, and until recently it was generally believed that the prognosis of bronchiectasis treated medically was extremely bad. Thus PERRY and KING [2] found that almost half of a series of medically treated patients died within five years of the onset of symptoms, while BRADSHAW et al.[3] showed that the average duration of life after diagnosis was less than two years. Such figures, collected in the early days of bronchography with iodised oil when only the grosser cases were likely to be recognised, led to the belief that surgical resection should be undertaken in every case of bronchiectasis where it was technically feasible, not only for the relief of present disability but also as insurance for the future. Since then improvements in surgical and anæsthetic techniques, better physiotherapy, and the control of infection by antibiotics have greatly reduced the risks of operation; and in 1947 MEADE et al.[4] reported that of 196 patients submitted to lobectomy only 1 had died. Perhaps the experience of LINDSKOG and HUBBELL [5] is more representative: in 165 resections, mostly lobectomies, the operative-mortality rate was 2·4% and the case-fatality rate 2·9%.

Despite the low mortality and the brilliant results in individual cases, operation should not be undertaken lightly; for even in the best hands complications must be reckoned with. LINDSKOG and HUBBELL show that before the introduction of antibiotics (and at an earlier stage of surgical and anæsthetic technique) two-thirds of their cases sustained some postoperative complication. The proportion has now been reduced by half: and pneumonia, bronchopleural fistula, empyema, hæmorrhage, and pulmonary tuberculosis arise much less often than formerly. On the other hand, pulmonary collapse—probably the result of retained bronchial secretions—remains a formidable problem, and not infrequently leads to fresh bronchiectasis. Pulmonary collapse is liable to follow any type of lung resection, but its incidence is greatest after operations on the lower lobe when the apical segment is conserved in an effort to avoid removing excessive amounts of lung. Pulmonary collapse follows this type of operation so often that some workers have abandoned it.[6 7] But HOFFMAN [8] claims that the late results of such collapse are not as bad as might be expected, and that in some cases energetic and prolonged medical treatment will lead to ultimate re-expansion and the reversal of any bronchiectasis that may have developed. A good deal more experience will be needed to substantiate this claim.

The rather high incidence of early postoperative complications would matter less if the late results were always good; but even the most enthusiastic reports, such as that of LINDSKOG and HUBBELL, do not record great improvement in more than two-thirds of those operated on. A surgeon's estimate of his own results is liable to be unconsciously influenced not only by his own enthusiasm but also by the natural wish of many patients to gratify one who has made strenuous and dramatic efforts to relieve them. When the results are assessed by a third party the picture is sometimes rather different. PATERSON [9] investigated the results of resection for bronchiectasis in a group of Canadian ex-Servicemen, and found that only half of them were satisfied with the results of their operation. Of the remainder some were not relieved of all their symptoms, others had persistent chest pain or dyspnœa, and several were subject to recurrent attacks of bronchitis although their bronchograms were normal. This last point is probably important. The new interest in chronic bronchitis may lead to a clearer distinction between cases in which symptoms are due to localised bronchiectasis and cases in which disability is predominantly due to concomitant bronchitis. There is no virtue in producing a normal bronchographic appearance if the patient continues to have cough, sputum, and bronchospasm. CHESTERMAN [10] claims that repeated bronchoscopy is helpful in coming to a decision.

A further problem whose importance is increasing as chest surgery becomes bolder and bilateral operations are more commonly undertaken is the consequent breathlessness. It is significant that in a small series of patients with bilateral resections studied by MANNIX et al.[11] none was regarded as fit enough to have a final postoperative bronchogram. Those who were relieved of cough or toxæmia paid the price in increased dyspnœa, due to the reduction in lung tissue and the pleural complications of lung resection, and possibly also to overexpansion of the remaining lung.

1. Laennec, R. T. H. A Treatise on the Diseases of the Chest. Translated by J. Forbes. London, 1824; p. 80.
2. Perry, K. M. A., King, D. S. *Amer. Rev. Tuberc.* 1940, **41**, 531.
3. Bradshaw, H. H., Putney, F. J., Clerf, L. H. *J. Amer. med. Ass.* 1941, **116**, 2561.
4. Meade, R. H. jun., Kay, E. B., Hughes, F. A. jun. *J. thorac. Surg.* 1947, **16**, 16.
5. Lindskog, G. E., Hubbell, D. S. *Surg. Gynec. Obstet.* 1955, **100**, 643.
6. Kergin, F. G. *J. thorac. Surg.* 1950, **19**, 257.
7. Mathey, J., Toussaint, J. *Acta chir. belg.* 1950, **49**, 747.
8. Hoffman, E. *Thorax*, 1955, **10**, 137.
9. Paterson, J. F. *Canad. med. Ass. J.* 1952, **66**, 433.
10. Chesterman, J. T. *Brit. J. Tuberc. Dis. Chest.* 1955, **49**, 174.
11. Mannix, E. P., Gerbasi, F., O'Brien, C. E., Adler, R. H., McAlpine, W. A., Kerr, H. *J. thorac. Surg.* 1953, **26**, 140.

Before the days of antibiotics most deaths in bronchiectasis were the result of infection. Such deaths are now uncommon, and the few bronchiectatics who do not succumb to intercurrent illnesses die of pulmonary heart-disease, respiratory insufficiency, or asthma. The effect of lung resection on the late incidence of such complications has not yet been assessed.

At present surgery (preserving the equivalent of a whole lung) is probably the treatment of choice for those with reasonably localised disease, much cough and sputum, and repeated attacks of pneumonia or hæmoptysis. The most suitable patients are older children and young adults; it is usually unwise to operate on patients under 10 or over 40 years of age. It is always difficult to select the right patients from those whose disease is either insufficient or too extensive to make operation worth while. But patients for whom operation needs to be considered are in a minority. Recent studies have shown that most of those with bronchiectasis are little disabled by their symptoms, and not uncommonly the anatomical change proves reversible. Thus MORLE and ROBERTSON [12] showed that temporary bronchiectasis affected more than half of a series of 300 consecutive cases of benign aspiration pneumonia, but threatened to become permanent in only 5%. Furthermore WYNN-WILLIAMS [13] found that 20% of patients attending a Bedford chest clinic for bronchiectasis were symptom-free; and the cases in this valuable study probably represent very fairly the general run of bronchiectasis as it is seen in the chest clinics of this country. Almost all led a normal life at home and did a job or went to school. Little deterioration was observed in the five years of the survey, and there were only 6 deaths—not all of which could be attributed to the disease. Pneumonia was the commonest complication, but the response to chemotherapy was uniformly satisfactory and the only death from this cause was of a patient who did not receive penicillin.

Evidence is accumulating that in the great majority of cases modern medical treatment, with its emphasis on postural drainage and the use of antibiotics, greatly limits the disability from this disease. The cases most in need of surgery are usually the least likely to benefit from it, on account of the extent of the disease or poor general condition. Despite the excellent results of many operations, there are good grounds for a conservative approach to the treatment of bronchiectasis.

Hodgkin's Disease

FOR over fifty years the ætiology of Hodgkin's disease has been the subject of theorising. The tuberculosis hypothesis has a long and respectable history; but now no-one believes in it, though active tuberculosis and Hodgkin's disease can exist together. JACKSON and PARKER [14] found co-existent active tuberculosis in 15–25% of their patients with Hodgkin's disease, but a survey at Boston City Hospital of post-mortem findings in 2000 cases of tuberculosis showed that Hodgkin's disease was found in only 0·3%. From time to time the disease has been ascribed to other bacterial infections, but investigation has supported none of these claims. In 1932–33 M. H. GORDON described his classical efforts to prove that Hodgkin's disease was a virus infection; but later work showed that the "specific" reactions on which he relied were, in fact, non-specific. The virus hypothesis was resuscitated in 1950 by LÖFGREN and LUNDBÄCK,[15] who had isolated and cultured a virus from ground-up lymph-glands; but nothing more has transpired. GENDEL et al.,[16] who noted an apparent association between Hodgkin's disease and cryptococcosis or torulosis, suggested that the cause might be a fungus infection; and there have been other reports on these lines. At present Hodgkin's disease is usually grouped with the reticuloses, and ROBB-SMITH terms it "fibromyeloid medullary reticulosis." The reticuloses are placed in the dim borderland between granulomas, which may be due to infection, and true neoplasms. Hodgkin's disease itself has never been classified as a malignant disease, although rarely the disease terminates in a sarcoma-like stage—the so-called Hodgkin's sarcoma.

THOMSON,[17] working at the Middlesex Hospital, now suggests that Hodgkin's disease is a form of tumour of the thymus gland. He points out that the developing thymus has a cervical portion which can give rise to ectopic thymus tissue in the neck. The cells present include lymphocytes and eosinophil polymorphs. The stages of differentiation of the Hassall's corpuscles are important. The first stage is a rearrangement into clumps of medullary epithelial cells, which increase in size and become large mononuclear cells with a vesicular nucleus and a prominent nucleolus; the next stage is the "owl's eye" appearance and formation of a "mirror-image" type of giant-cell; further development gives the fully formed multinucleate Hassall's corpuscle. Thus the cells that are the main elements of Hodgkin's tissue —the mononuclear vesicular cells, the mirror-image giant-cells, the lymphocytes, and the eosinophils—are all present in the normal developing thymus. Study of the lymphatic drainage of the thymus shows that lymph can pass upwards into the neck on both sides, and also into the chest wall and sternal area, and so downwards into the internal mammary chain and the liver; it can also drain into the tracheobronchial glands. THOMSON divides cases of Hodgkin's disease into three groups, according to the histological changes in affected tissue. In grade 1 there is a mass of lymphocytes in which a variable number of "mirror-image" or "owl's eye" giant-cells are buried; there may be a few eosinophils. This grade corresponds to the "Hodgkin's paragranuloma" of JACKSON and PARKER [14] and to HARRISON's [18] "benign Hodgkin's disease." Grade 2 is the classical Hodgkin's disease with mononuclear vesicular cells, mirror-image giant-cells, and Dorothy Reed cells in a fibrous stroma in which there are eosinophils, neutrophils, and lymphocytes. Grade 3 corresponds to the frankly malignant stage—the Hodgkin's sarcoma—with actively proliferating mononuclear cells and aggregations of these forming giant-cells.

12. Morle, K. D. F., Robertson, P. W. *Brit. med. J.* 1953, i, 130.
13. Wynn-Williams, N. *Ibid*, p. 1194.
14. Jackson, H., Parker, F. Hodgkin's Disease and Allied Disorders. New York, 1947.
15. Löfgren, S., Lundbäck, H. *Acta med. scand.* 1950, **138**, 71.
16. Gendel, B. R., Ende, M., Norman, S. L. *Amer. J. Med.* 1950, **9**, 343.
17. Thomson, A. D. *Brit. J. Cancer*, 1955, **9**, 37.
18. Harrison, C. V. *J. Path. Bact.* 1952, **64**, 513.

THOMSON suggests that the microscopic appearances of grade-1 Hodgkin's disease are identical with those of one type of mixed thymoma described by LOWENHAUPT and BROWN[19]; but these workers did draw attention to differences of detail between the cells in the two diseases. Grade-2 Hodgkin's disease THOMSON regards as "a mixed tumour of the thymus which is the pathological 'half-way house' of the mixed thymic tumour group"; it is a "neoplastic mixture incorporating all the elements of thymic tissue buried in a fibrous stroma of variable density, quantity and cellularity." This picture, THOMSON says, resembles that of the less differentiated type of thymic tumour. For clinical evidence THOMSON examined the records of 275 patients with Hodgkin's disease seen at the Middlesex Hospital. The patients with evidence of a mass in the thymic region when first seen or within a year afterwards numbered 112; 120 had involvement of the mediastinum at some stage of the disease, but not a thymic mass; in only 43 was there no record of mediastinal lesions, and in many of these the chest was not examined radiographically. Further analysis showed that the first group (with a thymic mass) was the youngest group, had a preponderance of females, and had the best prognosis. The second group (with mediastinal involvement) may have had thymic masses which had undergone sclerosis; this change is known to occur in thymomas even without radiation.

Before THOMSON's important hypothesis can be accepted confirmatory evidence from fields other than that of morbid anatomy will be needed. The clinical finding that 43% of his patients had thymic tumours sounds convincing; but JACKSON and PARKER do not even mention the thymus gland in their index of organs involved. If we allow that others have listed thymic involvement along with mediastinal involvement, a figure of 80% for combined thymic and mediastinal affection is surely very high; JACKSON and PARKER noted such involvement in only some 40%—and this from necropsy reports. There is no evidence that myasthenia is unusually common in Hodgkin's disease.

In its response to treatment, Hodgkin's disease resembles the reticuloses much more closely than the malignant tumours. Hodgkin's disease and the reticuloses (unlike malignant disease[20]) respond favourably to nitrogen mustards.[21] WILKINSON[22] has obtained, by means of nitrogen mustards, regression of lymphadenopathy in 83% of 80 cases of Hodgkin's disease; and WINDEYER agrees that chemotherapy is effective, especially when the disease is generalised.[23] Another chemotherapeutic substance that has been tested in Hodgkin's disease is phenylbutazone. ROTTINO et al.,[24] who used this drug in 35 cases, concluded that it was useful mainly in controlling pain and fever; any action on the Hodgkin's masses was inconstant, but they illustrate shrinkage of a mediastinal mass after nine months' treatment.

Hodgkin's disease is known sometimes to undergo spontaneous regression, and JOHNSTON[25] reported 5 examples not long ago; but so also do some malignant tumours,[26] so THOMSON's suggestion that Hodgkin's disease is truly malignant is not negatived on this ground. We hope that he and his clinical colleagues will seek further evidence to support his hypothesis; and meanwhile physicians can help by having radiographs, including a lateral view, taken of the chest in all cases of Hodgkin's disease—even those with apparently localised tumours.

19. Lowenhaupt, E., Brown, R. *Cancer*, 1951, **4**, 1193.
20. McCarthy, W. D. *New Engl. J. Med.* 1955, **252**, 467.
21. See *Lancet*, 1955, i, 440.
22. Wilkinson, J. F. *Proc. R. Soc. Med.* 1955, **48**, 365.
23. Windeyer, B. *Ibid*, p. 371.
24. Rottino, A., Joffe, A., Hoffmann, G. *Arch. intern. Med.* 1954, **93**, 561.
25. Johnston, A. W. *Brit. med. J.* 1954, ii, 916.

Annotations

SHIGELLA SYSTEMATICS

INTESTINAL bacteria now take up more of the time of the clinical bacteriologist than they have ever done, and the question may well be asked "Are intestinal infections commoner, or are we more conscious of them?" It seems that the answer to both parts of this question is in the affirmative; but a not unrelated consideration is the enormous volume of work being done on these organisms. Almost every issue of *Acta pathologica scandinavica* contains a description of new salmonella serotypes or has papers on the classification of some subgroup of the enteric bacteria; and consequently there is now less need for clinical pathologists to use vague terms such as paracolon bacillus or atypical coliform. With more and more study there are fewer and smaller lacunæ in our knowledge of the intestinal pathogens.

The shigella group has had particular interest for those working in semitropical areas, and names such as Boyd, Bensted, Large, and Sachs, to mention only a few of our own countrymen, indicate how the Serviceman abroad has easily fallen a prey to dysentery. All these men, as officers of the Royal Army Medical Corps, met dysentery in India and in the Middle East, and each made a contribution to our knowledge of the dysentery bacilli, and particularly to their classification. Work in more temperate climates has also produced advances; but there is some divergence of view between the temperate-climate worker and the Army pathologist. To the pathologist a shigella is a bacterium capable of causing dysentery in man—and consequently Sonne's bacillus is regarded by him as a shigella. To the systematist, on the other hand, a shigella is a bacterium with certain well-defined cultural and antigenic characters which should exclude Sonne's bacillus, and this organism should not have been allowed to remain within the shigella group. Similarly, evidence from the bedside makes dysentery due to Shiga's bacillus stand out as a disease with a difference—a difference which the clinical bacteriologist would extend to the laboratory classification of the causative organism. To the systematist, however, Shiga's bacillus is but one of many non-mannitol-fermenting shigellas, and he regards it merely as a serotype of one species, albeit a serotype of which many strains are potentially highly toxigenic. This difference of viewpoint was evident in the report of the International Enterobacteriaceæ Subcommittee to its parent body,[27] two members of which were unable to accept the recommendation of the majority of the Shigella Commission.

Agreement on an international level is desirable because dysentery is a disease that respects neither persons nor boundaries. The difficulties are not insuperable, but they will hardly be overcome unless the holders of the opposing views are prepared to compromise. Knowledge increases rapidly, and, as more atypical representatives of the biochemical subgroups are found, the experts may suggest a drastic revision of the shigella group by which it would have only a single species, *Shigella dysenteriæ*,

26. Dunphy, J. E. *New Engl. J. Med.* 1950, **242**, 167.
27. *Int. Bull. Bact. Nomencl. Taxon.* 1954, **4**, 47.

divided into several serotypes. There is no dispute as to facts, and any differences should not be seen out of perspective: disagreement among the experts mainly centres on a problem of classification and the resultant nomenclature. But experience has unfortunately shown that nomenclature engenders heat in even the coolest minds.

CLASSIFICATION AND SITE OF LUNG CANCER

THE cell type of a bronchial carcinoma has an important bearing on its behaviour.[1] Unfortunately many different classifications have been used, and even when different workers use the same classification it is by no means certain that they place similar tumours in the same category.

Lung cancers are often divided into three groups—oat-cell carcinoma, squamous-cell carcinoma, and adenocarcinoma. Oat-cell tumours have small cells with scanty cytoplasm and round or oat-shaped nuclei; but, whereas Kirklin et al.[2] state that the cells are never arranged in an organoid pattern, Walter and Pryce[3] tell us that in almost half of their oat-cell neoplasms there was rosette or tubule formation, the appearances sometimes resembling those of adenocarcinoma. This feature had previously been noted by Barnard,[4 5] and Walter and Pryce suggest that the true nature of the growth is indicated by the oat shape of the cells and by the absence of mucus, which they found was almost invariably present in adenocarcinoma. Squamous metaplasia is common in lung cancer, especially in adenocarcinoma,[3 6] and is a source of confusion, because by masking the significant cell type it may lead to an erroneous diagnosis of squamous-cell carcinoma. Walter and Pryce recognise two further classes of lung cancer—a polygonal-cell class in which they include anaplastic squamous and adenocarcinomas, and a class comprising invasive and metastasising adenomas. While admitting that different cell types may be present in one tumour, they believe that it is generally easy to classify tumours if the misleading factors are borne in mind. But clearly reports should include a precise definition of the histological features on which classification has been based. Is it too much to hope that some influential body will formulate criteria to which pathologists can refer so that observations from different centres may be comparable?

Walter and Pryce[7] also examined a series of bronchial carcinomas removed surgically to determine in what part of the bronchial tree the tumours had originated. They concluded that half of them arose in bronchioles or in bronchi too minute to be discerned by unaided vision. This finding tends to confirm the work of Raeburn[8] and Raeburn and Spencer[9] which casts doubt on the widely accepted view that the majority of lung cancers arise in the larger, more central bronchi.[10–15] A tumour in a central bronchus will, while still quite small, block the lumen, and symptoms arising from the consequent extensive atelectasis may lead to diagnosis at an early stage; a tumour arising in a small peripheral branch, on the other hand, may grow to a large size before producing effects that call attention to its presence. Hence, centrally placed tumours are on the whole more likely to be amenable to surgery when first detected, and it is fortunate that the majority of squamous-cell growths (the type with the best prognosis after "curative" resection) are so situated; adenocarcinomas are almost invariably peripheral; while the deadly oat-cell neoplasms do not seem to favour any particular part of the bronchial tree.[7] Walter and Pryce suggest that the frequency with which tumours are peripherally located is an important cause of the low operability-rate and poor prognosis in lung cancer; but a more fundamental reason is the early spread of the more malignant types.

TRAINING NURSES AT A UNIVERSITY

A WEAKNESS of pioneers is to rest—even to recline and put their feet up—on their laurels. The new nursing teaching unit to be established at Edinburgh University is being set up with the willing coöperation of the Royal College of Nursing, and with the aid of a five-year grant from the Rockefeller Foundation. The foundation offered this grant, we are told, because they had observed that in Britain there was available no preparation of nurses "within an institution of higher learning." In fact the status we give to nurse training appears nowadays, to others, as unduly low. We believe, of course (and surely rightly), that the job of a nurse is to nurse patients—not to become some kind of academic technician who leaves the actual nursing to lowlier grades. But if we are to hold to this principle we need more nurse teachers who are not merely of lively mind, but very well trained, able to distinguish wheat from chaff in the nursing curriculum, able both to choose the essentials and to teach them to non-academic students, and also able to impart their keen spirit to youngsters as lively minded as themselves—the sort who at present are often lost to nursing because they fear intellectual stagnation. As one senior nurse puts it: "Our British problem is how to conserve our sense of vocation, our devotion to patients, and our nursing skills, while utilising the advances in nursing education and administration which other countries, particularly America (but not only America), have made." Such an undertaking might be thought worthy of a university department of nursing, rather than a nurse teaching unit; but the appropriate affiliations of nursing are with the faculty of medicine, and there were administrative difficulties about starting a new department within this faculty. The unit, however, is to have its own director and advisory board, and will plan post-certificate courses and undertake research.

The Royal College of Nursing has long provided courses of training for State-registered nurses who wish to take the certificate for sister-tutors offered by London University, and has also collaborated with Edinburgh University in providing the course for the certificate offered there. Hull and Leeds Universities also offer courses and certificates for this qualification, which is now widely accepted as necessary for those seeking senior positions. But all these are courses for beginners in teaching: they are not advanced courses. The course offered at the new unit will be based on such courses, but with a revised curriculum for which the university will be fully responsible. A course at a similar high level, but specialising rather in administrative aspects, will probably be established as soon as possible. The unit, it is hoped, will also cater for senior nurses (Fulbright scholars, for instance). At the other end of the academic scale it may offer extramural courses for ward sisters and others. The Rockefeller Foundation provides for three research fellowships, spread over the five years covered by the grant. Subjects for research are yet to be discussed, but it is much to be hoped that these will include the

1. See *Lancet*, 1955, i, 954.
2. Kirklin, J. W., McDonald, J. R., Clagett, O. T., Moersch, H. J., Gage, R. P. *Surg. Gynec. Obstet.* 1955. **100**, 429.
3. Walter, J. B., Pryce, D. M. *Thorax*, 1955, **10**, 107.
4. Barnard, W. G. *J. Path. Bact.* 1926, **29**, 241.
5. Barnard, W. G. *Acta Un. int. Cancr.* 1938, **3**, 213.
6. Phillips, F. J., Basinger, C. E., Adams, W. E. *J. thorac. Surg.* 1950, **19**, 680.
7. Walter, J. B., Pryce, D. M. *Thorax*, 1955, **10**, 117.
8. Raeburn, C. *Lancet*, 1951, ii, 474.
9. Raeburn, C., Spencer, H. *Thorax*, 1953, **8**, 1.
10. Fried, B. M. *Acta Un. int. Cancr.* 1938, **3**, 153.
11. Willis, R. A. Pathology of Tumours. London, 1948; p. 366.
12. Boyd, W. The Pathology of Internal Diseases. London, 1950; p. 234.
13. Bryson, C. C., Spencer, H. *Quart. J. Med.* 1951, **20**, 173.
14. Davidson, M., Smithers, D. W., Tubbs, O. S. The Diagnosis and Treatment of Intrathoracic New Growths. London, 1951; p. 79.
15. Strang, C., Simpson, J. A. *Thorax*, 1953, **8**, 11.

clinical aspects of nursing: the need for a thorough revision of nursing methods was put forward in a recent article in the *Nursing Times*.[1]

This is the first unit of the kind to be set up, and it seems to promise well. The aim is not to prepare sub-doctors, or even super-nurses, but to enable some nurses, at least, to make the fullest possible use of the talents, vocation, and expert knowledge which they possess, and to develop their experience and insight in the favourable atmosphere of a university.

VENOUS COOLING AND REWARMING

Brock and Ross[2] have recently described some of their experiences of hypothermia in 20 patients having thoracic operations. At first they tried arteriovenous cooling, but as the disadvantages of cannulating an artery in a child became apparent they turned to venous cooling.[3] Blood was drawn through a catheter in the superior vena cava, pumped through a cooling coil, and returned to the inferior vena cava via the saphenous vein. Their technique has now been further simplified. The decision to use hypothermia is delayed until the chest is opened and the diagnosis confirmed, so that the patient is not unnecessarily subjected to the increased risks of the technique. Two catheters are then passed via the right atrium of the heart, one into the superior vena cava and the other into the inferior vena cava. The blood can be cooled fairly quickly, and if rewarming is started before the chest is closed, the period of hypothermia need only be brief. This is important because experimental evidence suggests that the proportion of deaths during and after rewarming increases when animals are kept at a low temperature for a long time.

Ventricular fibrillation can be effectively treated by electrical defibrillation during hypothermia, once myocardial tone has been restored by massage and the movements of the ventricles have become coarse and vigorous. If this complication arises during the production of hypothermia, cooling is stopped and cardiac massage started: there need be no delay when this particular technique of cooling is used. When fibrillation begins at a temperature low enough to allow the circulation to be interrupted, or during the actual cardiotomy, it is ignored, since it prevents air embolism and produces a less active operation site. The operation on the heart is then completed before applying massage and subsequent defibrillation. The induction of ventricular fibrillation as a means of preventing air embolism has already been described,[4] and more recently Melrose and his colleagues[5] have recorded experimental work on the deliberate production of cardiac arrest for this purpose and also to produce a motionless heart.

If ventricular fibrillation is to be prevented, an adequate coronary flow of oxygenated blood is essential. Berne[6] has shown that the dangerous stage is between 36°C and 28°C when the fall in flow is steepest, and Brock and Ross have often noticed arrhythmias in this temperature range. Ross[7] originally demonstrated in dogs that, during hypothermia, perfusion of the arterial tree with venous blood by a simple veno-arterial pump circuit improved the heart's action by increasing coronary blood-flow and reduced the incidence of fibrillation. Brock and Ross have now used this method in man, with the addition of an oxygenated blood drip to increase the oxygen content of the venous blood entering the arterial tree. They also point to the danger of an increasing heart-rate which reduces coronary blood-flow, and they report favourably on the value of a noradrenaline drip to increase the perfusion pressure while slowing the heart-rate.

One of the most interesting observations concerns venous rewarming, which Brock and Ross have used in man. When the cardiac part of the operation is complete, they put fresh catheters through the right atrium into the venæ cavæ and pump blood through the coil now immersed in warm water at 40°C. They have found that the temperature of the body can be raised to about 32°C in 20–30 minutes. This seems to be an effective method which can be used without disadvantage until the chest is almost closed.

BONE SALT

THE nature of bone salt has intrigued investigators for many years. McLean and Urist[1] have lately given a very useful account of the present position, partly based on the critical and lucid review by Neuman and Neuman.[2] The mineral portion of bone is in the form of crystals. Each crystal is a minute tablet, only 25–50 Å thick, approximately 400 Å long, and nearly as wide. Because of their thin shape the total surface of the crystals is enormous, and must amount to more than 100 acres in an adult man.[2] They lie on a protein network of collagen-like fibres—the bone matrix. In the tissue fluid bathing the salt and matrix there is a high concentration of an amorphous acid mucopolysaccharide, related to chondroitin sulphuric acid.

Crystals are made up of units in which the atoms have a particular arrangement characteristic of the crystal. From the way in which the crystals of bone salt diffract X rays it can be deduced that they have the structure of apatites, salts of calcium and phosphate which crystallise in simple forms of the hexagonal system. The mineral prototype is fluorapatite, $3\ Ca_3(PO_4)_2.CaF_2$. The apatite of bone crystal may be a hydroxyapatite[3]; and it has been suggested that the atoms of bone salt are arranged in a lattice of hexagonal columns, with a calcium atom at each angle of the hexagon, a tunnel of phosphate ions within the column, and hydroxyl ions at the centre of it. But in fact the arrangement of the atoms may be even more complex than that. It is hard to determine the arrangement precisely because a large proportion of the units are at the surface of the crystals, where there is adsorption and exchange of other ions—for instance, sodium, magnesium, carbonate, and citrate. The unit hexagons are 9·4 Å wide along one axis (*a* axis) and 6·9 Å wide along the other (*c* axis). The direction of the *c* axis is the long dimension of the whole crystal and it is approximately parallel to the collagen fibres. If bone is decalcified, leaving the collagen matrix, and is then allowed to recalcify under certain conditions in vitro, crystals of apatite are formed, with their *c* axis parallel to the fibres of collagen.[4] Hence it looks as if the organic fraction of bone may determine the structure of bone salt. But the collagen of bone must differ from the collagen of connective tissue because it allows calcification to proceed within it. The difference may be not in the bone collagen itself but in the acid mucopolysaccharide associated with it.[5]

Sir JAMES WALTON, extra surgeon to the Queen and consulting surgeon to the London Hospital, died at his home in Sussex on Aug. 27, at the age of 73.

1. Jackson, M. *Nursing Times*, May 20, 1955, p. 560.
2. Brock, R., Ross, D. N. *Guy's Hosp. Rep.* 1955, **104**, 99.
3. Ross, D. N. *Lancet*, 1954, i, 1108.
4. Senning, A. *Acta chir. scand.* 1952, suppl. no. 171.
5. Melrose, D. G., Dreyer, B., Bentall, H. H., Baker, J. B. E. *Lancet*, 1955, ii, 21.
6. Berne, R. M. *Circulation Research*, 1954, **2**, 236.
7. Ross, D. N. *Guy's Hosp. Rep.* 1954, **103**, 97.

1. McLean, F. C., Urist, M. R. Bone: An Introduction to the Physiology of Skeletal Tissue. Chicago, 1955.
2. Neuman, W. F., Neuman, M. W. *Chem. Rev.* 1953, **53**, 1.
3. Carlström, D. *Acta Radiol., Stockh.* 1955, suppl. no. 121.
4. Feitelberg, S., Meyer, F. Cited by Snapper, I. Rare Manifestations of Metabolic Bone Disease. Springfield, Ill. 1952.
5. Howard, J. E. *Bull. N.Y. Acad. Med.* 1951, **27**, 24.

Special Articles

TRENDS IN THE PRISONS

RECEPTIONS to prisons in 1953 numbered 2700 less than in the previous year, thus easing the overcrowding in local prisons.[1] The average population in prisons and borstals had fallen a little in 1953, and fell again in 1954. During the early months of the current year it was almost stationary at 21,300.

Borstal Training

A fall in numbers has its perplexing, as well as its bright, side. Borstal boys' institutions, with a population of only 2832 at the end of 1954 (fewer by more than 500 than in 1952), have found it possible to give more individual training to the boys, but have also found difficulty in completing some of the work commitments they had undertaken.

The borstal correction centre at the old Reading Gaol seems to be working out not too badly. It receives those boys who, for serious lapses, must lose the privileges of a training borstal for a while. During 1954, Reading received 326 boys for absconding, 61 for lapses on home leave, and 126 for other reasons. "Tempo is strict, privileges few (e.g., there is no smoking allowed at Reading), and normally after about 3–4 months a boy is returned to a training borstal, not cowed or bitter, but healthily convinced that it will pay him to 'go straight' and work for his discharge."

Borstal training itself is changing in many ways: the boys and young men are increasingly becoming a part of the community of the neighbourhood which surrounds them. Some are able to join local music, arts, and film societies, others enter for local drama competitions, while some belong to their own fishing club, visiting the river under the guidance of a training instructor who is also a keen angler. A borstal table-tennis club cycles over to play "away" matches with outside teams in a local league. Members of borstal staffs are more specialised than they would have been thirty years ago: education is in the hands of professional teachers, instructors in the shops are specialists in their trade, trained physical education instructors visit, and the psychologist, with the psychiatrist in the offing, is nowadays believed to be a useful person to have about. Yet as the Prison Commissioners rightly say, the fundamental influence in borstal training is that of the personality of a man or woman on a boy: "The borstal housemaster or officer remains the keystone of the work." The influence of such men and women is shown in the sustained improvement in figures for re-convictions.

Preventive Detention

By the end of 1954, 1375 men, sentenced under the Criminal Justice Act of 1948, had been received by the prison service, and of these 668 were serving the second stage of their sentence at Parkhurst and 80 at Nottingham. The advisory board at Parkhurst considered 110 men for promotion to the third stage, and decided to promote 13 of them. The final stage is spent in the hostel attached to Bristol Prison, from which the men go out to work.

As soon as they arrive they are given 10*s.* and told to go down the road and buy themselves shaving things, note-paper, and any other small items they need. This, it seems, acts like a tonic on people who have always been more or less under supervision; and on the whole they respond well. They greatly appreciate the hostel, and uphold its growing tradition. The Governor of Bristol Prison reports that a few weeks after beginning work many pass through a "danger period" in which their energies and interest flag; but once they have been steered through it they develop a keener interest in their work, especially as they become increasingly fit to do it. He suggests that recidivists may regularly experience such a danger period, and that this might be detected by noting when the average recidivist, after discharge, leaves his first job. Some extra help over the difficult time might help him to settle down again and make good.

1. Report of the Commissioners of Prisons for the Year 1954. London: H.M. Stationery Office. Pp. 196. 6*s.*

The Wider World

BRITISH NORTH GREENLAND EXPEDITION 1952-54

Medical and Physiological Aspects

H. E. LEWIS
B.Sc., M.B. Cape Town
OF THE DIVISION OF HUMAN PHYSIOLOGY, MEDICAL RESEARCH COUNCIL; FORMERLY LECTURER IN PHYSIOLOGY, UNIVERSITY COLLEGE, LONDON

J. P. MASTERTON
M.B. Glasg., D.Obst.
SURGEON LIEUTENANT, R.N.V.R.

Greenland is one of the largest islands in the world. Really it is a subcontinent, extending from the North Pole to well below the Arctic Circle (fig. 1).

Except for a narrow coastal belt, the country is covered by a huge ice sheet, rising to a height of some 10,000 ft. at its centre. At the periphery, the inland ice flows out in a network of glaciers to the sea.

The population of Eskimos and Greenlanders is about 20,000, mainly living on the West Coast in settlements. Formerly their main occupation was hunting, and the families were therefore scattered; but now, as a result of progressive Danish administration, fishing has been developed, and this has brought the communities together. Mining and sheep-farming are other important developments. Economy, education, and public health have all benefited by concentration of the population in fewer and bigger settlements (Christensen 1954). There has also been great political advancement, and Greenland now has the status of a county of Denmark, returning two members to the Danish parliament.

Although conditions on the West Coast are comparatively comfortable, the North East coast is bleak and almost uninhabited. Indeed a large area, the region of Dronning Louise Land, about 700 miles from the North Pole, had not been explored.

The British North Greenland Expedition, of which the Queen became patron and Sir Winston Churchill vice-patron, was jointly sponsored by the Services, the Royal Society, the Royal Geographical Society, and the Medical Research Council. In addition, there was support by private individuals and firms who felt sympathetic to a great new British venture to the Arctic—even though they might not be interested in its primary scientific objects. We must make it clear that the expedition, although handsomely supported by the Services, had no secret or strategic aim.

The plan of the exploration was as follows. The geologists, surveyors, and glaciologists were to travel by dog-sledge over Dronning Louise Land, which is about 4000 sq. miles (fig. 2). At the same time parties of geophysicists would make a traverse of the ice sheet, investigating its nature and foundations, using seismic and gravity-measuring techniques. They were to use petrol-driven "weasels" or snow tractors.

A weather and radio research station was to be established on the centre of the ice sheet, and its reports would go to the main laboratory where the other meteorological station would transmit all the information to the International Weather Network.

Physiological investigation was to be conducted on the men at the main base, and on parties returned from the field. (During two years the expedition had 30 members.) One of us was responsible for medical research

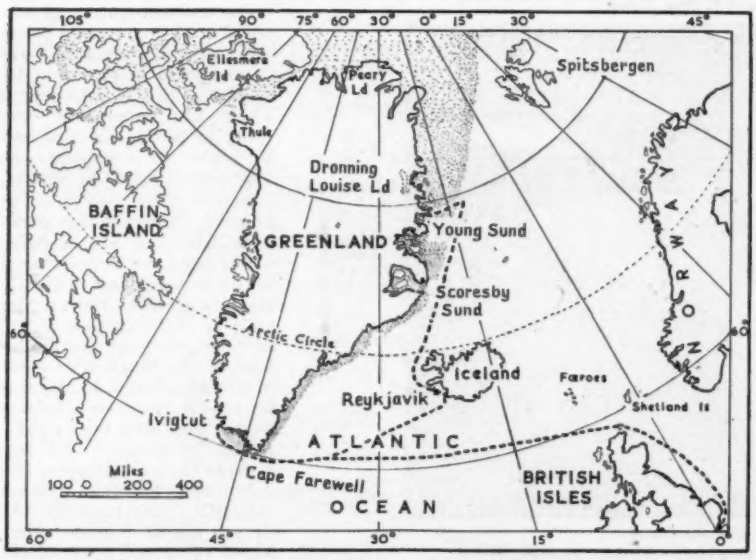


Fig. 1—Greenland

and the other for medical treatment; but we early entered into a complete partnership which was highly rewarding. Not only were our duties shared but the output of our work was increased and made all the more interesting. Also, the other members were probably quite pleased to have the choice of *two* doctors for their complaints instead of the one official medical officer.

Journey

During its passage through the North Atlantic in July, 1952, our ship, the Norwegian sealer *Tottan*, of only 600 tons, was severely buffeted, and most of us were seasick. We were grateful for the calmer waters of the Arctic Ocean; but here there were the hazards of the pack ice.

During winter, the sea freezes round the North East Greenland coast, and in the summer the thaw loosens the sea ice, which floats east and south, gradually melting. With the advent of another winter, the coastal waters freeze again.

The summer pack ice, which may be 20–100 miles wide, has always to be navigated by ships wishing to reach this part of the Greenland coast. We were stuck in the pack ice for a day, but fortunately a lead developed in the ice and we reached the coast without further trouble. Anchoring in Young Sund on a sunny night, we began to off-load the few hundred tons of stores and equipment, and our dog teams which had come from West Greenland. Having been cramped and often miserably sick during the three weeks at sea—which could have been avoided if we had travelled by air—we were hardly in the best condition for the stevedoring; but after a day or two we were able to handle with more confidence the heavy drums of fuel, the parts of the prefabricated hut, and the generators.

During this period we were up against two difficulties. First, there were no mechanical aids, and everything had to be "humped." Secondly, we had to work at great pressure, since the success of the expedition depended on establishing the base before the imminent freeze-up. The concentrated physical work made us very tired, and we were most anxious not to become prone to accidents. Fortunately the only accident was a finger laceration caused by a rusty nail.

In a few days Sunderland flying-boats of the Royal Air Force arrived to take us and our stores 200 miles further north to an inland fresh-water lake in Dronning Louise Land where the base was to be built. But before we left, we had a chance to look at the surrounding country which is very beautiful at this time of the year. Young Sund is a long fjord in which occasional icebergs drift with the tides and wind. On a calm day one can see the reflection of mountains with streaks of snow remaining from the previous winter. The air is so clear that distances seem much shorter than they are. For example, we estimated that the Sund was about a mile across, but in fact it was over 5 miles. This phenomenon could, under some conditions, be a source of hazard to travellers.

The vegetation does not grow higher than 9 in. It is brilliantly coloured by the yellow Arctic poppies, red saxifrage, and masses of bobbing white bog-cotton. Hares and foxes, and herds of musk oxen, roamed the valleys

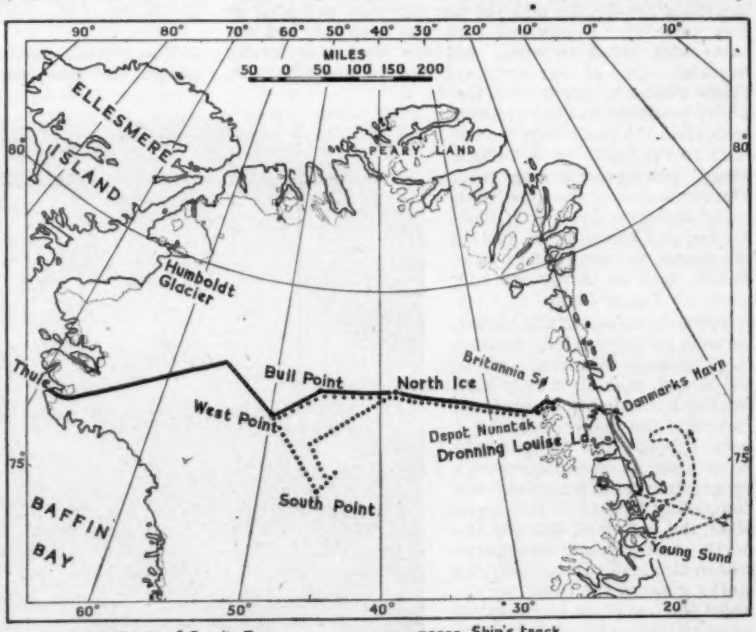


Fig. 2—Routes travelled in North Greenland.

Fig. 3—Position of Britannia Lake (aerial photograph).

* H. A. Jensen's Berg was named after Captain Hans Jensen, the Danish surveyor with the expedition, who was killed in April, 1953.

and lower slopes; and on the ice-floes polar bear, walrus, and seal might occasionally be seen; in summer there is thriving fishing for Arctic char. But the creature that intrigued us most of all was the mosquito, which though non-malarial had great nuisance value. Our preconception of the Arctic was disturbed also by the warmth, the temperature rising to 13°C (55°F), so that on a sunny day we worked stripped to the waist. However, great banks of sea-fog were often blown into the sound by sharp winds which made us scurry for our windproofs.

The first party to fly north established a shelter on the shores of the lake which we temporarily named Britannia Sø (fig. 3), and the aircraft were unloaded as they came in. A powered boat was dropped, but the parachutes failed to open, and the boat was totally wrecked. One of our outboard motors was also lost. These accidents meant that the loaded pontoons had to be hauled more than 150 yards from the aircraft to the shore by a "chain gang" pulling on a long rope. The remainder of the expedition party was soon flown to Britannia Sø, and the work of loading the planes was continued by the R.A.F. and an Army working party at Young Sund.

Towards the end of this period, we were getting anxious, because large icebergs were drifting into the Sound, making it very hard for the flying-boats to take off. Indeed if the operation had not been speeded up, there would have been no medical research programme; for Young Sund was completely iced up a few hours after the last load left for the north—and all our equipment was in this load. Eventually, by working round the clock, we enabled the last plane to get safely away on its flight back to Britain, leaving us alone at Britannia Sø.

Our medical equipment consisted of 13 boxes and a dozen large oxygen cylinders; but these had to be stored under tarpaulins (fig. 4) until Sept. 9 when the laboratory was ready to take them. Our first job was to complete the living-hut to give us shelter.

Before this work was finished, however, a party left Britannia Sø, sledging about 250 miles to the interior of the northern part of the ice sheet to establish the weather station. Hastings aircraft had been standing by at an air base on the North West coast of Greenland, and, in response to signals from the sledging party, they flew in, to parachute the prefabricated sections of the hut, supplies, and equipment for this weather station. Unfortunately one of the planes crashed (Mackersy 1953) and some of the crew were injured. We, at base, were in radio contact with "Northice," as the weather station was called, and were able to give them medical advice, while the expedition members there helped to make the crashed plane as comfortable as possible for them all until they were flown out by an American Arctic air-rescue team.

As soon as "Northice" was completed—at the end of October—the support party sledged back, leaving, as planned, three expedition men at the station for the winter. The return journey took about fourteen days, and the party got back to Britannia Sø in the half-light of late autumn.

Living Arrangements

THE HUT

The prefabricated parts of the hut weighed 24 tons crated, and many pieces required 6 men to handle them.

Fig. 4—The physiological equipment, stored under tarpaulins until the laboratory was built.

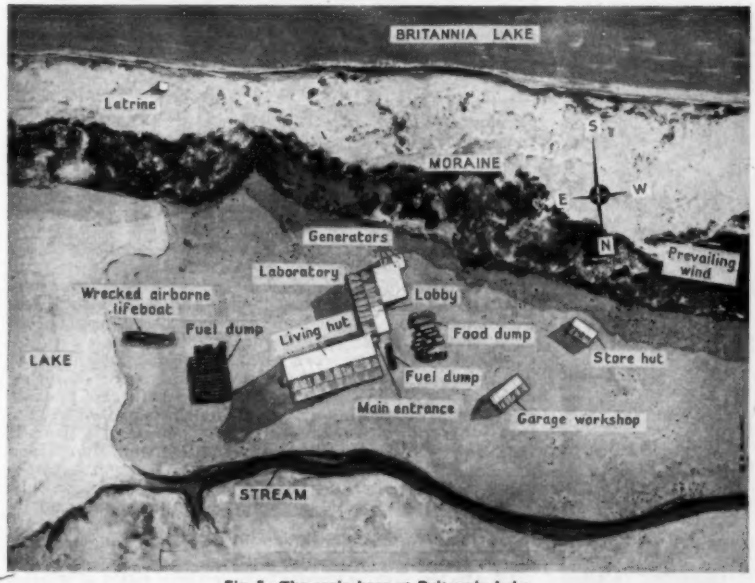


Fig. 5—The main base at Britannia Lake.

We levelled a raised spit of ground on which the foundation beams were laid. On these we erected the floor and wall panels. These panels were made of waterproofed 5-ply wood with a prefabricated internal insulation of glass wool and soft board. A layer of aluminium foil as a reflective insulator and vapour barrier was added, and a final facing of hard board completed the inside finish.

The job went smoothly, though on average there were only 6–8 men continuously engaged—others being away on support parties or reconnaissances. In just over a fortnight the huts were weather-proofed and only indoor construction remained.

The main base (fig. 5) comprised the living-hut, the laboratory, and, at a little distance, a garage and a store-room. An uninsulated passage separated the living-room from the laboratory, so that in the event of fire, either hut could be isolated by breaking this down. This lobby was unheated and contained the lavatories; it also provided shelter for apparatus normally used in the cold. For example, some cameras were kept there to avoid the moisture which would condense on them if they were brought into a heated and humid part of the hut.

At one end of the living-hut we assembled a slow-combustion stove which weighed 2 tons; round it we partitioned off the kitchen, in which we also installed a stainless-steel sink and the water-butts—two empty petrol drums, cement-washed on the inside to prevent rust. In addition there was a small larder which was particularly convenient because food taken directly from outside required a few days to thaw before becoming usable.

The living-room was about 25 ft. square, adequately heated by a diesel-oil stove (fig. 6). A corner was partitioned off as the sick-room, and most of the physiological work was done there. The dormitory led off from the living-room and had about the same floor-space. It likewise had one oil stove, and contained 6 cubicles with 2 double-tier bunks in each.

All windows were of triple glass and the entrances had two doors. Unfortunately the doors were too flimsy, letting in drift; and, not being strongly hung, they tended to break away from the hinges when closed against packed snow. When the temperature fell below —10°C (12°F), it was dangerous to touch the round brass door-knobs with the ungloved hand, for the skin froze to the metal and would blister. This discomfort was readily avoided by binding the door-knobs with sticking-plaster, which gave a better and safe grip. Handles of the kind used for car doors would have given easier leverage.

Ventilation of the huts came from adjustable openings over each window. During the winter, with its sudden wind changes, the huts were often too hot or too cold, owing to inefficient regulation of the stoves and ventilation. There was a great temperature gradient from roof to floor and a constant feeling of stuffiness; and, although the heating equipment was adequate, it would have been an advantage to have some means of circulating the warm air—e.g., a fan.

In small huts and vehicles in the Arctic the danger of carbon-monoxide and petrol fumes is always present, because one tends to keep ventilation to a minimum. We had no satisfactory means of detecting these gases. Now, however, several carbon-monoxide and petrol-fume detectors are on the market.[1]

1. The best and simplest seems to be made by a German firm, Dräger of Lubeck. Siebe Gorman and Mine Safety Appliances Company Ltd. in Britain both manufacture good detectors.

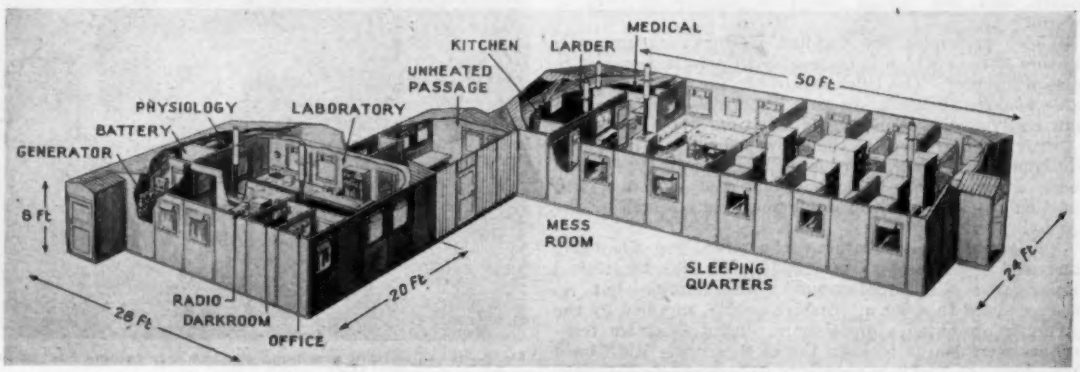


Fig. 6—The main base hut. Note the space allocated to physiology and medical work.

Fig. 7—The string vest and pyjama-type drawers. The latter are loosely fitting, and therefore warmer than the usual "reach-me-downs." The vent permits defæcation without unnecessary exposure.

Fire is one of the most dreaded disasters in the Arctic. Though there is plenty of snow and ice, there is no water. At convenient places in the hut, there were various fire-fighting appliances such as axes, pails of sand, carbon-dioxide, and trichlorethylene extinguishers; and during the winter there was a rota for nightly fire-watch.

CLOTHING

The effectiveness of clothing depends on a few simple principles. Insulation is achieved by trapping layers of warm air, but the fabric must be freely permeable to water-vapour. If perspiration cannot pass through the various layers it will condense on the inside and freeze, accumulating all the time and progressively filling the garment with frozen sweat. Since the thermal conductivity of sweat is much greater than that of air, the body-heat is then rapidly dissipated to the cold atmosphere, and the person has little chance of keeping warm.

These principles are fulfilled in fur garments, the leather base of which is permeable to perspiration and is also windproof. The thickness of the fur traps innumerable pockets of insulating air. But fur is expensive and not easily available in large quantities.

Provided one keeps to the above principle it makes no difference what fabrics are used, and certain types have been evolved from experience in cold climates, and particularly as a result of intelligent field research by the Army.

The expedition left Britain with a mixed bag of clothing and also of advice (Walker 1953). We took traditional Polar wear—windproof trousers and anorak—but we soon realised that the alternative outfits, supplied by the Army, represented a great improvement. Certain techniques were learnt to keep the clothes dry. With hard muscular activity it is necessary to prevent overheating, because this increases sweating, and one soon learns that before hard work, one should remove a garment, putting it on again when the job is over.

To meet these requirements, the Army clothing physiologists evolved an outfit designed in layers.

(*a*) The *string vest* traps a large layer of warm humid air next to the skin. It also separates the shirt from the skin and so prevents it becoming clammy.

Long underpants, like pyjama trousers, are much warmer than the usual "winter woollies" because they are loose round the leg. In addition they are split at the back, to permit defæcation without having to undress. (fig. 7).

(*b*) A *flannel shirt* is worn; and *fleecy inner trousers* when the cold is extreme.

(*c*) Windproof *combat jacket* and windproof *trousers*. Both these items were excellently tailored, with many useful pockets. 'Zipp' fasteners permitted ventilation so as to avoid overheating during activities.

(*d*) The *parka* was worn as the outer garment and was greatly appreciated by the members. It was windproof and had a wool pile lining. There were driftproof pockets and a large cowled hood which could be adjusted to give best protection against the wind by bending the inbuilt malleable wire rim. It had a generous "tail," on which one could sit, and a flap which could be brought between the legs, buttoning in front, to protect the genitals. Zipp fasteners permitted ventilation of the garments as desired.

(*e*) The hands were protected by three or four layers of *gloves*, the outer two being mittens.

(*f*) On the feet one wore two or three pairs of *woollen socks*, a *duffle sock*, and *leather* boots in which there was a thick plastic insole. Perspiration would freeze on the insole; but at night one could easily take the boot off, remove the insole and shake it free of rime.

When the temperature fell to −12°C (10°F) perspiration froze nearer the skin than was comfortable, and then the members wore *canvas mukluks* instead of the leather boots. The canvas offers less resistance to the egress of perspiration, which has a better chance of passing away from the skin before it freezes.

Fig. 8—In bad blizzard conditions, the face may become iced up in spite of protective clothing.

Fig. 9—Breadmaking in the expedition kitchen.

(*g*) The head and face were protected by a *hood* attached to the combat jacket, and also by the *cowl* of the parka. *Woollen ear-warmers* were a useful addition.

In the first year, most of the men grew beards; but in the second year only 6 grew them, and the rest kept a short stubble. The advantages of a beard are doubtful. Above –12°C (10°F) it protects the skin from frostbite, but at lower temperatures it rapidly ices up from facial sweating, from trapping the moisture of exhaled air, and thirdly from the nasal secretions which flow profusely in extreme cold (fig. 8). The iced-up beard prevents movements of the neck and jaw, and makes it difficult to undress. More serious, probably, is the fact that the clothes freeze to the beard, and lose their warming property, since they are now bound to the skin by ice instead of being separated by a layer of warm air.

The total weight of the Army-type clothing assembly was about 23 lb.—one-third heavier than the Everest clothing (Pugh 1954).

Snow-glasses

We were issued with two types of *snow-glasses*. The first was a goggle containing red glass; men who wore spectacles used them in a modified frame. The second type was a polaroid spectacle which proved unsatisfactory in that the plastic lenses were easily scratched: moreover, the whole article was so shoddily made that the frames broke and the lenses fell out before they had been worn a week. Both these kinds of glasses were also unsatisfactory because there was no satisfactory provision for ventilation around the rims and the goggles steamed up quickly during exercise. It is annoying to realise that a much better frame had been evolved as a result of Army research and could have been provided.

Very little experimental work has been reported on the optics of sun-glasses. One of the few papers is by Peckham and Harvey (1951) who conclude that the important requirement is to eliminate 80–90% of the visible rays, the remaining small proportion of light reaching the eye being quite adequate for visual acuity. Apparently it does not matter what sort of filter is used, and they found that cheap spectacles, even with minor flaws, were quite as satisfactory, over a summer season, as specially ground lenses costing twenty times as much.

Sleeping-bags

We were issued with a variety of down-filled sleeping-bags, and in extremely cold weather we used two—one inside the other. They were excellent for temperatures down to –20°C (–13°F), but were inadequate below this. The main disadvantages were:

1. *Tightness*, which can be eliminated by a roomier bag, combined with a slippery nylon liner, so that a man can turn over inside the bag rather than with the bag (Pugh 1954).

2. *Lack of insulation on the under surface*, which was caused by compression of the down. One usually carried a sheepskin mat, but this also became flattened. Canadian workers have suggested the use of a safari-type couch with down insulation on the under-surface of the canvas sling. In this position, the insulation is not compressed by the weight of the body; and it has the additional advantage that the sleeper and his covering are suspended, and not in close contact with the snow (Hildes 1955).

FOOD

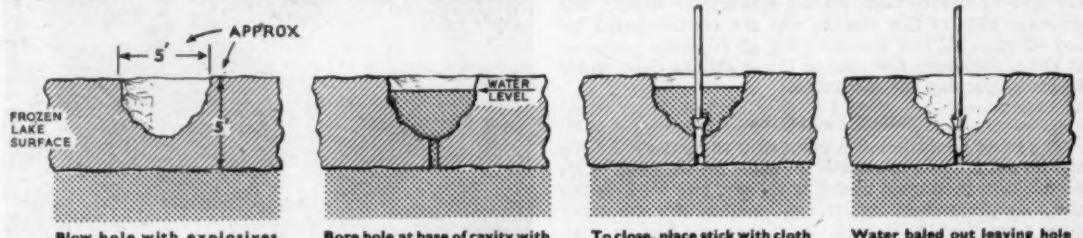
The subject of food will be dealt with fully in another publication. The food supplied, all brought from Britain, consisted of tinned meats, vegetables, fruit, and many varieties of dried foods such as cabbage, potatoes, carrots, and onions. Some shortages developed, particularly of milk and sugar. We very much lacked tinned meats of good quality.

It was found that many desirable products, such as whole potatoes and other root vegetables, eggs, bacon sides, salted meat, cheeses, and sausages of Scandinavian type, would have kept perfectly in the cold. During the cold months, Greenland is just like a gigantic deep freeze, and at the height of summer these foods could have been stored in ice if necessary. They cost no more than tinned foods.

Frozen potatoes and other root vegetables cook admirably so long as they are cooked as soon as they are brought in from outside. Solid frozen potatoes are quite different from the useless frosted ones often seen in Britain. (The reason why frosted potatoes are inedible is that they have been thawed slowly and the fluid has left the cellular portion in the process.)

Bottled products must be kept indoors, for most of them freeze and crack in the cold.

Alcoholic drinks were mostly in the form of spirits. Tinned or bottled beer would have been a more general favourite but because of its bulk was not included. Concentrates of beer would have overcome this difficulty.



Blow hole with explosives. Bore hole at base of cavity with ice-drill (water-pressure causes hole to fill). To close, place stick with cloth plug in hole. Water baled out leaving hole in readiness for future use.

Fig. 10—Method of obtaining water from frozen lake.

Fig. 11—The toilet bucket being carried away from the hut. Note the interest shown by the puppy.

Cooking

The slow-combustion stove was too small for cooking and heating water for 20 men. Everyone took turns at cooking (fig. 9), and the best system found was 3 men cooking for four days for 20 people. Cooking could be a time-consuming chore, yet it was a change. Some people felt that it took up valuable time which could otherwise be spent doing scientific work. Two schools of thought developed on the subject; one was in favour of a professional cook and the other supported the existing system. We ourselves differ on this point, though we agree that in the absence of a cook everyone should explicitly be warned beforehand that cooking duties are essentially part of his job.

Sledging Ration

While travelling by dog-sledge we carried with us a standard sledging ration giving just over 4000 calories per day in a weight of 27 oz. It consisted mainly of pemmican (a combination of fat and meat powder), butter in large quantities, chocolate, dried milk, biscuits, and sugar. This diet was adequate but boring; it could have been improved with more variety and made more attractive with colourful wrappings and modern packing.

Water

The water-supply during winter was difficult. When the lake ice was at its thickest, two metres of it had to be cut through to get at the water. Explosives and drills were tried with varying degrees of success. The best method we found was to dig a trough in the ice about 0·5 m. deep and 0·75 m. in diameter and then bore a hole from the bottom of this to water level (fig. 10). The water gushed up into the trough and from it we filled buckets. During the summer—from early June until mid-September—water was procured from a little stream running beside the hut. We had to ensure that, during summer or winter, the drainage area of this stream was not contaminated by dog excreta. Water was used for all domestic purposes at the surprisingly low rate of $1^1/_2$–2 gallons (just under 10 litres) per day for each man.

TOILET FACILITIES

The toilet facilities left a great deal to be desired. We had no small space or cubicle set aside for washing. This would have been most useful, with, say, two wash-basins and a simple shower. As little as 3 gallons of warm water gives a satisfactory shower. As it was, one had to wash in the kitchen or living-space.

There was a single latrine in the unheated joining portion of the hut. The excreta were held in a 45-gallon petrol-drum cut in half. This closet was very cold and in high winds exceedingly draughty. A more comfortable compartment would have been appreciated. The excreta froze in the drum, which had to be emptied approximately every third day. This meant going out into the cold and hauling the drum on a little sledge to a place about 50 yards from the hut where the contents were dumped (fig. 11). It was a nasty job, as it took some time to loosen the frozen material from the drum; and because of its unpopularity a rota had to be established. Sometimes the drum was not emptied until after it became over-full, and on these occasions, visits to the toilet were far from pleasant. Often the seat was contaminated with frozen urine. To make the job of emptying less irksome, a disposable waxed cardboard carton of similar size to a half petrol-drum might be used. Though more expensive, these would store easily if they could be nested into each other. Some 200 would suffice for 20 men for two years.

From about mid-April until late September there was a latrine in the open about 50 yards from the hut (fig. 12). This was a good arrangement, and the dogs were used as natural scavengers since they are coprophagous even though we have evidence that there is no extra fat available in the fæces (Masterton, Lewis, and Widdowson 1955).

While sledging, the techniques of defæcation and urination were somewhat modified. However, neither function was difficult or liable to cause frostbite. While urinating one stood with one's back to the wind, and the penis itself was partly protected by the hand. When defæcating one squatted with back to the wind. A slit in the seat of the underpants allowed us to defæcate without lowering them; and they gave some protection to the buttocks.

Many sledgers found that the gastrocolic reflex worked soon after breakfast while they were breaking camp. This was convenient, for they were able to defæcate in the shelter of the tent before striking it.

(To be concluded)

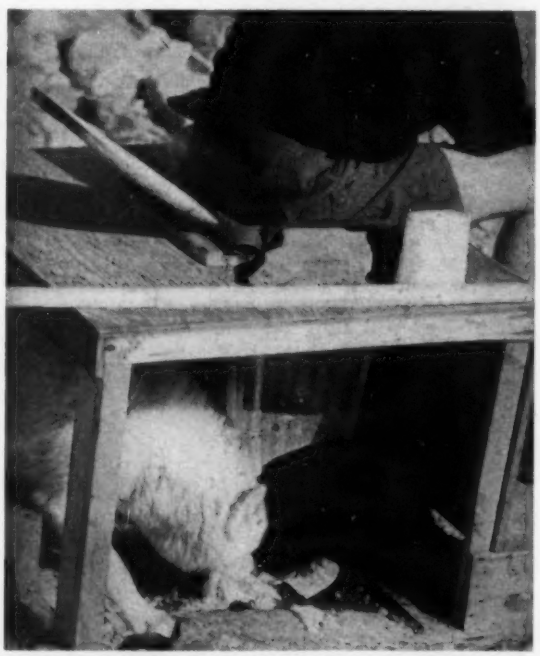


Fig. 12—Coprophagia in husky dogs. In the summer the toilet seat was placed in the open. Note the aluminium guard and the long stick used to deter over-enthusiastic dogs.

In England Now

A Running Commentary by Peripatetic Correspondents

THE instinct whereby birds migrate across continents and eels swim thousands of miles to the Sargasso Sea, is rare in *Homo sapiens*. But somewhere in the heart of Surrey stands a small hospital which has that effect on whoever may once have dangled a stethoscope within its walls. By tradition, no member of the medical staff leaves without a farewell celebration to which residents and consultants, past and present, migrate mysteriously and with unerring instinct. And since tenures of office are continually drawing to a close, each new ceremony tends to become bigger and better than the last.

The way these gatherings come about is a matter for conjecture. Some say that it is the ceremonial hot punch —the secret of which is handed down from generation to generation of resident anæsthetist—which calls the clan together. But then, this strange instinct has been felt beyond England's northern border, and it seems hardly credible that Sassenach smells can be detected in the homeland of whisky.

The fact remains that, several times a year, peripatetic inclinations are irresistibly drawn to the verdant beauty of Surrey. Before nightfall, I find myself passing through those well-beloved gates, where a familiar ditch traps the unwary and the porter is always asleep; past the flag-pole regularly adorned with some object carefully selected to arouse the secretary's spleen; up the central ramp which serves as the main corridor and can, in practice, accommodate a pre-war Austin 7; in the direction of distant gramophone music and the occasional strains of a badly played violin, to the medical officers' mess where a spirited party is already in full swing.

Seeing so many old friends in a familiar setting produces the strange feeling that nothing has changed and that time has stood still. But the illusion is always broken by someone who has a new job, car, or wife; or who proudly shows photographs of three offspring instead of two; or who has at last passed the Membership, only to find himself deprived of his premier pastime for the past ten years.

* * *

The general surgeon's instruments have many domestic uses. Spencer Wells forceps, scalpels, and cutting needles can do things in the home which would otherwise be impossible. The crocodile forceps which accompany my signoidoscope have recovered a wedding ring from the lavatory and fallen bolts and washers from inaccessible parts of my car. I have even "visualised" a golden hamster in my cystoscope, through a small hole in a skirting-board, and thereby been able to plan intelligent incisions which resulted in its being restored to its tearful owner. No home indeed is properly equipped unless it contains a surgical bag.

I have, however, always entertained a certain feeling of superiority towards gynæcologists and their tools, and this comfortable sensation has lately received remarkable confirmation in the domestic sphere, under the following circumstances. My wife and I recently moved house. Having unearthed during the upheaval a curved Reverdin needle which had been bequeathed to me by a gynæcologist relative, I thought it would be useful for some suturing of a stair-carpet. It proved a most handy weapon for this purpose, and when the real man from Messrs. Harraples came for the fitted carpet in the bedroom I proudly told him of my discovery and handed him the Reverdin needle to inspect. He looked at it, at first critically and then with cold anger. "What!" he said, "Stick that bloody great thing through a good piece of carpet? I've more respect for this nice Wilton, and I hope you'll keep that for what it was meant for." So just was the rebuke that I forgave the terminal preposition and I apologised to him with the courtesy of one whose deepest convictions have been vindicated.

* * *

On my journey from Chicago to Cleveland I was joined in the dining-car by a citizen of Oklahoma. Inquiring about my destination, he began to cross-examine me on a city which he had not visited for more than 25 years. Eventually I confessed that I was merely a visitor to the United States, and this brought forth a further inquiry as to what I thought of the country. I expressed the statutory admiration for its development and growth, which elicited a further question on the existence or otherwise of certain business premises on —— Street in Cleveland. I was now "caught" and had to confess that I had only arrived in the United States a little more than a week previously. This drew forth exclamations of wonderment and congratulation from my companion, who said, "Allow me to congratulate you on having learned to speak English in one week." To my embarrassment he called along the steward to join in the congratulations with the remark that "This gentleman has been in our country for one week, and you listen to him speaking English."

* * *

Admittedly we National Service M.O.s tend to grumble about anything and everything; but when the part of the Arab Legion which came over for our Tattoo had an over 50% "going sick" rate, I think for once we were justified.

The orderly said "There's a bus load of Arabs just arrived, Sir." I thought he was using a figure of speech; but there, outside the hospital, was a hired charabanc with every seat occupied and some standing. We watched amazed as an N.C.O. marshalled them into a considerable squad and marched it to the M.I. room. Only one of them spoke English, and his tutors had obviously been soldiers. Swear words which made even the orderly shudder were used in a charmingly polite manner, as adjectives of emphasis. Their complaints were not numerous, mostly foot-rot, and rather exotic abdominal symptoms, but therapy was difficult. A universal lack of confidence was expressed in white medicines and tablets. Castellani's paint had its firm adherents among one group, while others preferred gentian-violet or brilliant-green to be applied to the affected part. One rather likeable little private with dancing, laughing eyes and a hallux valgus held the view that "brown stuff given with a needle" (pointing to the mist. expect. bottle) would cure him.

On the ward, we had no interpreter, until a patient admitted that he knew a little Arabic. As he was confined to bed, ward rounds were made by the M.O. and sister followed by two orderlies pushing the interpreter's bed along to each Arab's bedside. There was a minor calamity when a wheel came off his bed and the leg ploughed a furrow in the floor, brilliantly polished ready for the C.O.'s inspection. Later, when our interpreter had left hospital, we were faced with serious communication difficulties. We wanted to tell the one remaining Arab that he could go back to his unit. We tried "Go," "Scram," "Scarper," "Allez-oop," to no avail, when a previously silent Pioneer in the next bed, in best military language said, "Go on,——off!" The effect was immediate. The Arab leaped out of bed, gave us a crashing salute, bowed three times, offered cigarettes all round, dressed, and disappeared. Some words are international.

* * *

It is just a hundred years since Thomas Addison published his monograph "On the constitutional and local effects of disease of the suprarenal capsules," thereby establishing himself, among other things, as a leader of the supra-men in their perennial struggle with the ad-men.

Today many people would picture a conflict between ad-men and supra-men as an ugly scene, with no holds barred, between commercial television tycoons and B.B.C. producers; but Addison and his opponents were of course merely concerned with the position and nomenclature of the endocrine glands situated near (or above) the kidneys. Seeing that Addison's own name began with "ad," and that he was writing so long before the Birmingham revision of the Basle *Nomina Anatomica*, it is perhaps surprising that he should have elected to be a supra-man; but in this he is followed by all anatomists and many surgeons. On the other hand, nearly all other doctors are ad-men. They steadfastly continue to speak and write of the "adrenal glands," and scorn such fanciful concoctions as "suprarenaline," or even, as the Americans have it, "epinephrine."

The debate continues—*supra caput, ad infinitum*.

Letters to the Editor

BREAD

SIR,—In their cautious report, issued by the Medical Research Council, Dr. Widdowson and Professor McCance stressed repeatedly that the results of their investigation on German school-children applied only to the conditions under which the investigation was carried out; but Professor McCance in his recent Sanderson-Wells lecture went a long way towards explaining the background for people's preference for white or brown bread. However, as you point out in your leading article of July 30, a panel, under the chairmanship of Sir Henry Cohen, has now been set up by the Government to advise on the whole question of the extraction-rate of flour. It will be in possession of all the facts and it will arrive at the truth.

With these considerations in mind it is difficult to understand that part of your article which now suggests that the 70% flour in the Widdowson-McCance investigation was not a 70% flour at all but one approximating to an 80%. Presumably the Medical Research Council will in due course publish a spirited reply refuting such a suggestion; but meanwhile, as the person responsible for the preparation of the different flours used in the investigation, I would only point out that this portion of your article appears to have been written with very little knowledge of the effects of extraction-rate on the composition of flour. To say the 70% flour was comparable to National flour is incorrect and, therefore, misleading.

Cereals Research Station, St. Albans. T. MORAN.

*** Clearly we must give more fully the grounds for our statement:

The 70%-extraction flour used during the preliminary period in one orphanage, and during the first half of the preliminary period in the other, had a thiamine content ranging from 1·4 to 2·3 µg. per g. (These were the figures obtained under the direction of Dr. Moran: the corresponding figures obtained under the direction of Dr. Holman, of the M.R.C. team, were 1·6 to 2·3.) The first consignment of 70%-extraction flour used in the experimental period (which was a mixture of 35% English and 65% Manitoba) contained 1·4 µg. of thiamine, and 19 µg. of nicotinic acid, per 100 g. (Holman; Moran's thiamine figure was 1·1); the second consignment contained 1·6 µg. of thiamine and 19 µg. of nicotinic acid (Holman). In the recent book by Dr. Moran and his colleagues, to which we referred, the average figure for thiamine in 73%-extraction flour is given as 0·90; and 70%-extraction flour will of course contain less. Indeed 70% extraction flour made from a mixture of 35% English and 65% Manitoba (at a moisture content of 15%) should have a thiamine content of 0·72 µg. per 100 g. if one uses the analyses given by Moran, McCance, et al. (*Biochem. J.* 1945, **39**, 213) quoted in the book, or of 0·75 µg. if one uses the figures given by McCance et al. in the M.R.C. tables (War Memorandum no. 14, 1945). From this we conclude that the 70%-extraction flour used in Germany had a thiamine content somewhere about twice that given by McCance and Moran for 70%-extraction flour used in this country.

In thiamine content the 70%-extraction flour used in Germany did not quite reach, on the average, the figure of 1·9 µg. derived from Moran, McCance et al. (1945) for 80%-extraction flour; but in nicotinic acid it surpassed typical 80%-extraction flour. The figure for each of the two batches in Germany (Holman) was 19 µg. per g., which may be compared with those derived from analyses given by Moran, McCance, et al. (1945)—namely, 8·1 µg. for 70%-extraction, 10·3 µg. for 80%, and 12·3 µg. for 85%. Elsewhere Dr. Moran and his colleagues at St. Albans gave 16·5 µg. per g. as the nicotinic acid content of 80%-extraction flour (*Nature, Lond.* 1945, **155**, 717).

Similarly, the iron content of the 70%-extraction flour used in Germany was high—in fact, the same as that of typical 80%-extraction flour. The figure for the flour used in Germany was 1·7 mg. per 100 g., whereas typical 70%-extraction flour, as used before the war, has been stated to contain about 1·0 mg. (cf. McCance and Widdowson, *Med. Res. Coun. spec. Rep. Ser.* no. 235, 3rd imp. 1942, where the figure given is 0·92 mg. for 70 to 72%-extraction). Typical 80%-extraction flour contains 1·6 mg., according to both McCance et al. in the M.R.C. tables (1945) and Moran et al. (*Nature, Lond.* 1945, **155**, 717).

These facts seem to justify our statement of July 30 that the 70%-extraction flour supplied to Professor McCance and his associates for their nutritional trial in Germany was comparable to 80%-extraction flour as used in this country. We await with interest the opposing evidence on which Dr. Moran so confidently relies.—ED. L.

WHOLEMEAL BREAD

SIR,—In your leading article of July 30 you said that the question to be decided by the scientific panel recently appointed by the Government is whether it is better to keep to high extraction (that is, National flour) or to use flour from which a number of nutrients have been removed and to which three have been restored.

I should like to support your opinion that when it is a question of altering what has been a staple food for a very long time, the onus of proving advantage lies on those who wish to make the alteration and not on those who are opposing it.

From the public-health point of view, I think that members of the public who desire to have wholemeal bread should be sure of being able to buy a loaf of this kind when they ask for it. From correspondence which I have had with the Ministry of Food I have ascertained that there is no statutory definition of "wholemeal" for the purposes of the Food and Drugs Act. In a code of practice drawn up for the guidance of authorities, the meaning given to "wholemeal" bread is bread in the preparation of which the whole of the flour used is of an extraction-rate of not less than 95% from clean wheat. A baker who sells as "wholemeal" a bread containing flour of a lower extraction-rate than 95% could be prosecuted under section 3 of the Food and Drugs Act, 1938. (Incidentally, I have not heard of a prosecution.) Although it should be possible for a baker to obtain "National brown flour" of 95% extraction or over, there is no guarantee that if a customer asks for a wholemeal loaf he will be supplied with one made of flour of 95% extraction. Under the Flour Order, 1953 (no. 1282) "National brown flour" means flour complying with the following conditions:

(1) It shall contain the maximum quantity of wheat germ which, having regard to the type of milling, can be included in such flour.

(2) It shall consist of wheat-flour and shall either be of an extraction-rate higher than 80% or shall be of substantially the same nature and composition as such a flour.

In other words, "National brown flour" need not be any higher than 80% extraction.

It will be admitted also that when a wholemeal loaf is asked for, the average shop assistant will supply a brown loaf which more than likely is not made from wholemeal flour.

The present position is that if a customer wants a wholemeal loaf, he must ask for a loaf made from one of the proprietary brands of flour "to which nothing has been added and from which nothing has been removed."

It is worthy of comment also that the National brown loaf is subsidised but not the wholemeal loaf.

I trust this point will be taken into consideration by the panel recently appointed.

Northampton. C. M. SMITH
County Medical Officer of Health.

BREAD AND MILK

SIR,—Our grandmothers knew the answer—give the child "bread and milk" and he will soon pull out of his trouble! The old dears never realised that bread (Professor McCance and Dr. Widdowson, July 30) and then milk (Professor Brock and others, Aug. 20) would eventually form opening original articles in *The Lancet*. Biochemistry has already given some of the reasons for grandma's intelligent guess. By adding these foods together the sum-total of the amino-acids is about as perfect a physiological combination as is possible. The pros and cons are interesting: whole wheat contains a pretty good all-round protein mixture, but, perhaps significant, rather low lysine (2·7%). Milk is up on lysine; caseinogen contains 8·3%, lactalbumin 8·4%, β-lactoglobulin 11·4%. The lysine content of partitions of human plasma are: serum-albumin 11·4%, γ-globulin 8·2%, fibrin 10·1%.

Wheat-protein has a high content of glutamic acid (wheat-glutelin containing 25·7% and wheat-gliadin 45·5%). Milk proteins are lower in glutamic acid (lactalbumin 12·9%, caseinogen 22·0%). Wheat-flour and milk therefore make a first-class amino-acid team, including tryptophane (and by adding some yeast the lysine content is further augmented). One of the most significant remarks of McCance and Widdowson is perhaps: "If diets such as the ones we were using, consisting largely of cereals and vegetables, can be made so nutritious that they cannot be improved by a milk supplement, this should greatly simplify the problem of those interested in nutrition in parts of the world where milk, meat, and other sources of animal protein are difficult to obtain." The dietary therapeutic trial in kwashiorkor by Brock and his colleagues, and their observations that a synthetic formula of "vitamin-free" casein is so effective in raising the serum-albumin, and that their amino-acid formula C_2 gave similar favourable clinical signs of "initiation of cure," suggests that possibly wheat-flour itself may not be far off the mark in similar manner. Wheat-flour contains about 10% protein, which of course includes glutin and gliadin and glutelin, all of which have a wide spectrum in their amino-acid composition.

Is wheat-flour worth serious consideration in this search for "initiation of cure" and in the eventual "consolidation cure"? Brock et al. note the troublesome diarrhœa of kwashiorkor as it occurs in Cape Town, Pretoria, and Durban and that gastro-intestinal intolerance of experimental diets is an important problem. Wheat-flour, as an added cereal to milk, has sometimes significant effects in checking diarrhœa in infants and young children. Quite often liquid fermenting acid stools will soon become formed, non-fœtid, and neutral or slightly alkaline. Gluten, the noxious substance in cœliac disease, appears to have an important physiological adjuvant function in the gut of the normal (non-cœliac) person. Hippocrates noted "when the bowels are irregular and the stools acid a thick decoction of wheat should be given," and Celsus (aphorism 38) said "there is more nourishment in bread than any other meat." No wonder Wellington's soldiers were, according to Bowles,[1] noted for their stamina and good looks—they got a daily pound of wheat grain which they more often than not chewed and ate on the march.

While "something" in milk protein will no doubt give a strong answer to the kwashiorkor problem it may well be that wheat-flour will be a very practical maintenance remedy. If, as has been shown possible, the wheat-plant protein content can be increased 2% by a synthetic urea fertiliser,[2] there would be millions of tons of protein added to the world's crop. Prophylaxis may thus be possible on the scale required.

1. Bowles, G. *Lancet*, 1954, 1, 52.
2. Match, R. *Reader's Digest*, March, 1955, p. 107.

I hope Brock and his colleagues will devise, as part of their research programme now that they have something of a basic test of "initiation of cure," some dietary experiments with wheat-flour. It may yet be, as McCance and Widdowson record, that Plato was right when he pictured, in the ideal State, men living into healthy old age on wholemeal bread.

Department of Child Health,
University of Bristol. A. V. NEALE.

PERSONAL HEALTH SERVICES IN LONDON

SIR,—In April of this year the London Local Medical Committee considered proposals to transfer certain health services from the London County Council to the Metropolitan Borough Councils. After careful deliberation, the committee was unanimous that the transfer proposals were not in the best interests of the population of London. This view, which was also adopted by the London Executive Council, was transmitted to the London County Council. Nevertheless, the London County Council has now decided to proceed with these proposals and to seek the necessary legislation. If this is obtained, the county council will transfer maternity and child welfare, vaccination and immunisation, day nurseries, and the regulation of child minders to the borough councils; whilst health visitors and home helps are to be shared between the county council and the borough councils.

This committee has experience of the personal health services as conducted before 1948 by the 28 Metropolitan borough councils and since 1948 by the London County Council with its 9 divisional health committees and the large number of members coöpted from the borough councils, bringing knowledge of local conditions.

Whilst there are several parts of the health service it is of the utmost importance that there should be full coördination between them. Despite the tireless efforts of the borough medical officers of health the service provided before 1948 was of a very varied degree. The population of London is entitled to expect and receive the best possible health service. It is difficult to see how the fragmentation of the services conducted so successfully by the London County Council will help to secure this end.

The Local Medical Committee is gravely perturbed that, in face of this evidence, the London County Council is proceeding with its proposals.

F. GRAY
Secretary, Local Medical Committee
for the County of London.
London, W.C.1.

*** This subject was discussed in our issue of July 16 (p. 139)—ED. L.

PREVENTION OF TUBERCULOSIS

SIR,—In his letter placed on the Widdicombe File in your issue of Aug. 13 Dr. Brewer says: "I assume that the general practitioner's first responsibility is to detect cases early and refer them for proper treatment." But he feels he is fighting with one hand tied behind his back because he has not an X-ray department within easy reach.

Poor Dr. Brewer! Could he not strengthen his remaining hand—even if the other cannot yet be untied—by sending sputum specimens to be examined? The outfits are supplied free of charge; the patient himself "takes" the specimen, and nearly always pays the few pence postage; he is saved (at any rate at first) a tedious journey to the nearest town; and the result is likely to be received more quickly than an X-ray report. Dr. Brewer should try it some time: it is one contribution he could make which is not mentioned in his otherwise inclusive letter.

Public Health Department,
County Hall, Lewes. F. LANGFORD.

HOMOSEXUALITY

SIR,—I cannot share Dr. Learoyd's surprise at your printing an anonymous article on Male Homosexuality. Surely a matter which merits the attention of a committee authorised by the Home Office is of sufficient importance to justify the widest public discussion.

I have long held that adult sexual behaviour is the business of the individual concerned, providing always that there is adequate protection from corruption of children and adolescents. There must be revision of the law which allows female homosexuality to go unpunished but which can still prescribe heavy penalties for male homosexuality. The present position of the law opens wide the door to blackmail of the homosexuals by unscrupulous persons. It should not be beyond the ingenuity of Parliament to provide a civil equivalent of Sec. 40 K.R.'s & A.C.I. (Conduct Prejudicial to Good Order and Discipline).

Homosexuality has been present in every community through the ages, and, though it can be regarded as an arrest of psychosexual development, it is remarkable how many homosexuals have a high standard of intelligence and artistic creative ability (cf. Emperor Hadrian and Tschaikowski).

Surely the time has come for some understanding and tolerance of these people so that it would be no longer possible for a learned judge to say that in cases involving abnormal sexual behaviour you never get a true verdict from a jury—because half of them cannot believe such things happen and the other half indulge in such practices.

London, S.E.17. E. K. PRITCHARD.

SIR,—I read with dismay Dr. Learoyd's letter of Aug. 13, in which he criticises what seemed to me to be an honest, sensible, and instructive paper from a self-confessed homosexual. Dr. Learoyd refers to "the author's dreary case-history," and his sixteen years of treatment by psycho-analysts "who conveniently put the blame . . . on the parents and early environment." But surely a case-history, if true and accurate, is an essentially personal record of the development of a person's suffering, and as such is all-important. It may be monotonous, but it can only be dreary to someone who has lost interest in his patients and is therefore no longer fulfilling the rôle of doctor.

By his reference to the psycho-analysts "conveniently" putting the blame on the author's parents and early environment, it is obvious that Dr. Learoyd hardly believes this to be a true explanation of the author's condition. Unless he has himself followed the author's development and treatment, by what right does he make such a criticism? Furthermore, his criticisms are unconstructive. He makes light of the sixteen years' psycho-analysis, but what is his alternative treatment? It should be remembered that there are three people a homosexual can go to for help—another homosexual, a priest, and a doctor. The first is undesirable and the second will send him to the third. What would Dr. Learoyd himself do if a patient came along to him with a tragic confession of his own homosexual problems? Would he kick him out, or would he try to help him?

He goes on to suggest that legalisation of homosexuality would be disastrous. Whether legalisation would be right or wrong, it is doubtful if it would make a lot of difference, for apart from the usual argument that female homosexuality is not illegal and does no apparent harm (sociologically) it remains a fact that homosexuality is repugnant to most people, and would always carry a social stigma, and accordingly would never be pursued in any way openly. And assuming the law is left unchanged, what good is it doing? I should imagine that homosexuals are as likely to be deterred by the knowledge that what they are doing is wrong, as prostitutes are likely to be converted by being made to pay their ridiculous forty-shilling subscriptions. What must be realised is that, in crime and vice, sexual behaviour falls into a special category. This is because sex is a fundamental in human behaviour, and like any other human function it can be utilised properly, excessively, or abnormally. Whatever we like to think we are doing to "purify" our way of life, sexual abnormality and indulgence will persist because our modern way of life—civilisation, as it is called—is in reality unnatural. It imposes a strain, and the strain appears in a number of ways, including abnormal sexualism. Do we see sexual abnormality or neurosis in animals, except when man induces it?

How can Dr. Learoyd disapprove of the author's sixteen years of psycho-analytical treatment when he remembers that the only practical alternative to such treatment is prison? Does he honestly think that if psycho-analysis is of meagre help, prison will be any greater help? When brothels were closed in France, were we to believe that all the inmates promptly transferred to biscuit factories? Remember too that there was some sort of medical inspection in brothels, whereas free-lancing prostitutes will doubtfully be controlled for venereal disease. I do not wish to give the impression that I sympathise with indulgence; I am merely trying to show that modern legal remedies are probably useless. One of your correspondents, writing on the death sentence, spoke of "legality before justice"; here it is legality before common sense.

The homosexual problem is obviously both a sociological and a medical one. At present it would appear that of all the attributes needed in its approach, patience is the most valuable.

Stockport, Cheshire. JOHN FORBES.

SIR,—Dr. Learoyd objects to the appearance of my article while the Home Secretary's committee is sitting. But Lord Winterton is reported to have said in the House of Lords on May 19, 1954, that he thought it might assist this committee if discussion took place in Parliament, the press, and elsewhere. Dr. Learoyd's views are now well known. I do not see why he should wish to deny mine a hearing.

He also dislikes my use of the Kinsey figures. I only ask that anyone interested should read the relevant portions of the Kinsey report, read exactly what I said, and see whether they can detect the "naïve juggling" of which he complains.

Since Dr. Learoyd and I start from quite different premises, it is not surprising that we arrive at different conclusions. He seems to start from the assumption that homosexuals are a negligible minority of irresponsible persons, interested only in their own selfish gratification, and he brushes aside any evidence or opinion to the contrary. I start from the assumption that the majority of homosexuals are responsible and useful citizens. I regard it as just as unreasonable to legislate as if all homosexuals were irresponsible and amoral, as it would be to do the same in the case of heterosexuals.

In fact I doubt very much whether the usual public attitude or the present law do lessen homosexuality. I suspect that the position is in some ways analogous to prohibition and alcoholism. Homosexuality is not prevented but driven underground, so that its most undesirable forms are apt to flourish. The Scandinavian countries are obviously not the sinks of iniquity that they should be according to Dr. Learoyd's arguments, but it would be interesting to know how their incidence of homosexual prostitution and homosexual seduction of children and young persons compares with ours.

May I try to explain, for the benefit of those with the imagination to see, something of the homosexual's point of view—what is liable to be the effect on him of the usual public attitude to these matters? I have no doubt that the feeling of being unwanted and excluded from

the family is important in the genesis of all homosexuality. One motive in the homosexual's make-up is to go his own way, rebel against the family, and perhaps even punish it for its treatment of him. Another is to find someone or a group of people with whom he does not feel unwanted and excluded. In so far as society repeats and reinforces a feeling of ostracism and exclusion, it tends to confirm the homosexual in his perverse and rebellious ways and to encourage him to seek associates and groups with whom he does not feel unwanted. If we really wished to lessen homosexuality, we should attempt to rehabilitate responsible homosexuals into society, reserving punishment or segregation for the irresponsible minority who may be a danger to children and young persons.

THE AUTHOR OF THE PERSONAL PAPER.

SEQUELS TO ANÆSTHESIA

SIR,—May I briefly restate my views? There are three adverse factors possibly operative during "operations under general anæsthesia"—namely, (1) cerebral circulatory failure, (2) the drugs used, and (3) cerebral metabolic disturbances. Now these three factors, in greater or less degree, are common to an extremely large number of patients undergoing operations under general anæsthesia, the vast majority of whom are entirely unharmed. Further, quite apart from surgery and general anæsthesia, massive blood-loss has produced extreme dementia, but has done so in only a small proportion of patients suffering severe hæmorrhage. And again, the "shock state" due to cardiac infarction and seen sometimes in pneumonia has produced the same cerebral catastrophe and yet has done so in only a very small proportion of cases. Why? I believe that the explanation lies in an individual susceptibility or idiosyncrasy to one or other of the three factors I have mentioned; but, since this idiosyncrasy cannot be detected beforehand, it is of paramount importance to avoid or correct with urgency any of the causes within the three factors. As you, Sir, put it—the patient's reason is at stake.

At no time did I incriminate nitrous oxide itself; for, although there is a theoretical possibility of idiosyncrasy to this, or indeed to any other, agent, there is no clinical or experimental evidence to support it. Dr. Azzopardi charges me with views I do not hold.

But the adverse effect of anoxia on the brain is a fact proven beyond argument. And unfortunately nitrous-oxide "anæsthesia"—particularly in unskilled hands—is too often nitrous-oxide asphyxia, as Dr. Azzopardi himself points out. My statement that "nitrous oxide is still widely used" is in fact synonymous with "asphyxial 'anæsthesia' is still widely practised"—and this your correspondents know full well. Dr. Bourne needs no defence; but in simple justice I would point out that Dr. Cartwright entirely misrepresents his friend when he attributes to him the view that "these mishaps were due to nitrous oxide per se."

When I wrote "it is not enough to quote survivals, for the patient's mental state is also a matter of grave moment" I had in mind the fact that the minor dementias following operations under general anæsthesia would almost certainly be diagnosed as "neurosis" or "senility." It was for this reason that I limited my examples to cases of dementia, about which there can be no two opinions. Dr. Cartwright—and I fear too many others—dismisses too lightly as hysteria the mental disturbances which have followed asphyxia inflicted under the guise of anæsthesia. Doubtless they would similarly have dismissed Courville's cases had these not, unhappily, come to necropsy!

Dr. Bromage is to be congratulated on his mental immunity to self-induced hypotension, but this does not surprise me. What is indeed surprising is his generalisation from this fact. By analogy with my own cases the risk of his suffering extreme dementia thereby is very small. However, he himself has shown previously that there is in fact a risk, and that induced hypotension may be accompanied by evidence of cerebral damage. It matters little from a practical point of of view whether this is due to the hypotension itself or to the consequent anoxia. I agree that controlled hypotension is a great convenience to the surgeon. So is exsanguination, and other debatable measures. But the justification for their employment clearly depends on the care with which the risk of applying them is weighed against the risks of withholding them. And here again I would emphasise that it is not enough to assess the risk to life alone—the patient's reason is of equal importance. Although the majority of patients come through these manœuvres unharmed, a few die, a few may suffer catastrophic mental impairment, and an unknown number may sustain minor cerebral damage and would subsequently be labelled "neurotic," "hysterical," or "senile." Having seen such cases I freely admit to the "prejudice" of which Dr. Bromage accuses me. But not, I think, without cause. His inference that I withheld facts concerning case 2 is, I assure him, quite without foundation; nothing sinister lurks on my side of this iron curtain he has conjured up. His complaint that I too summarily dismiss the factors of fat-embolism, positioning in anæsthesia, &c., is a matter of opinion, but I feel is largely unwarranted as a careful reading of my paper will show. Much has already been published, and much remains to be written, on the rôle of positioning in anæsthesia—with particular reference to spinal pressor reflexes, the influence of the leg-down position on blood-pressure, the enhancement of effect on blood-pressure of leg and trunk position in spinal anæsthesia (often used in prostatectomy), and the enhanced effect of posture, movement, and transport in oligæmic and other shock states and in controlled hypotension—but a detailed discussion on this subject was beyond the scope of my paper, and would come better from those whose particular interest it is. Seneca's authority for the view that old people do not bleed like the young is scarcely acceptable in the light of more recent observations. Shakespeare (1606) states "yet who would have thought the old man to have had so much blood in him" (*Macbeth*, Act V, Sc. 1). In this case the operator *was* troubled by much bleeding.

I find much to agree with in Dr. Massey Dawkins's letter, but again a discussion on regional anæsthesia was beyond the scope of my paper.

Cowley Road Hospital, Oxford. P. D. BEDFORD.

STAFFING THE TRANSFUSION SERVICE

SIR,—However unpleasant Dr. Bowley may think it, it remains a fact that the primary duty of a transfusion centre is to provide blood as and when required: and if, as your annotation of July 16 stated, a regional centre can provide blood only for "urgent" cases, then it is failing in its primary duty. The national figures for unused blood are not pertinent, but although the new pilot bottles have increased the work of my regional centre, they have allowed us to reduce our returns to 2% or less, in spite of a 12% return from the wards. If this level is grossly exceeded, then I submit that the regional transfusion director might tactfully lighten the darkness of those who waste blood.

I cannot agree that there is little relation between routine antenatal testing and cross-matching of blood for transfusion. The ABO and Rh testing techniques are identical, whilst the tests for antibodies are identical with the cross-matching procedures generally used. The only difference is that antenatal testing can always be done at leisure, checked, and rechecked—which is rarely possible in cross-matching; for this reason ante-

natal testing is an admirable training for work in blood-transfusion. Although in my laboratory we cross-match about 350 bottles a month, we also study about 200 new antenatal blood samples, screen 30 or 40 sera for antibodies, titrate out 5–10 sera, and do a varying number of direct Coombs tests: certainly without this solid block of work my technical staff and I would be far less confident in our reagents and our techniques—and this would affect not only our transfusion work but also our diagnostic work in, for example, suspected hæmolytic anæmias. I should like to hand over to the regional centre all sera in which antibodies have been demonstrated, or in which, on clinical grounds, antibodies are expected but cannot be demonstrated. This would ensure that the transfusion centre would acquire the sera it needs.

Centralisation of antenatal testing is administratively elegant, but, as Dr. Bowley (Aug. 6) is now finding, not always convenient. In a large city such as Sheffield there are several hospitals and a transfusion centre competing with each other and with industry for suitable technical staff. The transfusion centre is the most highly specialised of all these—and few intelligent young men are likely to enter a field in which promotion is slow and from which transfer is likely to be difficult because of this specialisation. And if, by some mischance, such a man does enter that field, he will leave it as soon as he realises his error.

In smaller centres, where there may be but one hospital laboratory, a pathologist who establishes contact with the local secondary schools should, in a few years' time, have built up an excellent technical staff.[1] Reasonably frequent broadsheets from the centre or one-day revision courses should then maintain a high standard of work, so that in spite of some increase in the use of sera and of man-power, the regional centre and the hospital laboratory could balance their demands more evenly.

Central Middlesex Hospital, London, N.W.10. GEORGE DISCOMBE.

INCOMPLETE PITUITARY INSUFFICIENCY

SIR,—May I comment on the interesting letter from Dr. Wilson and his colleagues (Aug. 13)?

The writers have now established that their case 6[2] suffered from primary hypothyroidism and, in addition, some degree of pituitary insufficiency. They conclude that a pituitary lesion might have aggravated a pre-existing thyroid deficiency. It must appear equally possible to anyone, and to me more probable, that a pre-existing hypothyroidism conditioned a pituitary inadequacy, with an increased liability to postpartum hæmorrhage, and finally a minor degree of postpartum necrosis. In a male cretin, aged 26, under my care (case 6[3]) thyroid therapy increased his output of follicle-stimulating hormone (F.S.H.) from 0 to 18 mouse units per 24 hours. D'Angelo and his co-workers have demonstrated that thyroid-stimulating hormone may actually disappear in hypothyroidism only to reappear when the hypothyroidism is cured. What hypothyroidism may do to the functions of the pituitary is the subject of recent and, as yet, scanty consideration.

The further investigation of their case 7 has now established that both thyroid and adrenocortical failure can occur in hypopituitarism in the absence of sexual failure. This is an important observation, and to complete the record may we have the result of the F.S.H. assay in this patient? This is an exception to the usual sequence of pituitary failure, but these exceptions may have more importance than the general rule when we understand the formation of the pituitary hormones. The usual human sequence has recently been demonstrated to occur also in dogs by Ganong and Hume (Boston) by progressive ablation of the hypophysis, and in them sex, thyroid, and adrenocortical failure proceeded in this order. In a patient of mine (case 7[3]) with a craniopharyngioma this sequence was not observed and both sex and adrenocortical failure were established, but no evidence of thyroid failure could be obtained.

In congratulating Dr. Wilson and his colleagues on the conclusion of their investigations, may I point out how admirable was the conduct of this scientific debate? The experts had criticised the conclusions of the junior authors, who rejoined courteously and were thereupon given facilities for the further investigation of their cases, to the enlargement of our understanding of disease in the pituitary.

Derby. DOUGLAS HUBBLE.

THE DEATH PENALTY

SIR,—With the greatest respect to some of your correspondents, I think that they are making this matter too complicated. Ethical problems may indeed have been occupying the minds of men of genius for over two thousand years; yet it is a strange fact that most great ethical advances, such as the abolition of slavery, have not, I think, arisen out of brilliant, logical, and lucid expositions of the philosophers. One of the great failings of our generation is the deification of the intellect; yet as Christians—and we are a Christian country—we know that wisdom is granted to quite simple people, unversed in the language of philosophy, where matters of right and wrong are concerned.

This may be dubbed as mere emotional thought; but many of us believe that the death penalty, like war, is neither effective in its object nor in line with our interpretation of the Christian way of life. To such simpler folk this is sufficient answer to the problem.

Leicester. PAUL HICKINBOTHAM.

SIR,—Sir Francis Walshe (Aug. 13) asks for the rational argument against capital punishment. May I quote it, *sans m'engager*?

The object of the death penalty is primarily to deter potential murderers. In some countries and parts of countries the penalty has been abolished or temporarily suspended. In these circumstances neither the rate nor the trend of the rate of murder has been significantly changed.

If these propositions are correct, then capital punishment fails in its main object, and, unless there are other arguments for maintaining it, it should be abolished.

Oxford. C. W. M. WHITTY.

SIR,—I am what James Thurber would describe as a man with big brown eyes and a tiny mind; and so discussion on ethics, Aristotle, and philosophy is well above my head.

In theory I may support abolition of capital punishment, but, as a father of small children, in the event of their murder I should naturally desire revenge. Hatred is as natural a feeling as love.

The important point that has so far been missed is that the final responsibility for the continuance of the death penalty rests upon the electorate. If people want murderers to be hanged, they will be. If they desire the penalty to be changed, they must mandate their representatives accordingly.

Dr. Day's letter of Aug. 13 calls for comment. He suggests severe penalties for the unauthorised carrying of lethal weapons. But how many murders are committed by lethal weapons (and I take it Dr. Day means guns, knives, and coshes)? Surely the common methods of murder are hammers, axes, carving-knives, and last, but by no means least, a pair of hands. Are these everyday articles to be outlawed?

1. Gray, J. D. A. *Lancet*, 1948, ii, 939.
2. Wilson, L. A., Auld, W. H. R., Bowman, W. *Ibid*, 1954, ii, 715.
3. Hubble, D. *Ibid*, 1955, i, 1.

On the morning that Ruth Ellis died I realised she was paying the penalty for a cold-blooded murder: and yet when I looked at my watch at 9.15 A.M. I felt a little sick. But not as sick as the day the Rosenbergs were electrocuted.

Hanging may be right or wrong, I just don't know. But from a practical point of view, it is the public that must decide to retain the rope, or find another method of coping with this particular crime.

Kenilworth. F. E. D. GRIFFITHS.

SIR,—Sir Francis Walshe asks for a "lucid and logical statement" in support of the case against capital punishment. I wonder whether he regards this as a logical statement: to take deliberately somebody's life is today regarded as the most abominable crime man can commit. (I do not know whether there are any "logical" reasons for this general conviction or whether it is a purely "emotional" attitude.) How then can we, in spite of our severe condemnation of deliberate killing, empower and pay a person to do just this?

I know society allows—and may even order—men to kill in self-protection, but only in cases of utter emergency. A handcuffed prisoner does not confront us with such an emergency. The potential danger which he may still represent can effectively be dealt with without anybody having to commit the crime which everybody professes most deeply to abhor. May this abhorrence be founded on a logical or psychological basis, the abolition of the death penalty must be the logical consequence of this generally professed abhorrence.

St. Lawrence's Hospital, Caterham, Surrey. LISE GELLNER.

SIR,—Sir Francis Walshe says that it is a pity that none of your correspondents make a "lucid and logical statement" against capital punishment. But surely no-one, least of all a doctor, needs to find elaborate excuses to save a life. On the contrary, the onus lies on those who wish to see their fellow humans put to death to find a *very* good reason why it should be done.

Geneva. W. NORMAN TAYLOR.

ACUTE CHOREO-ATHETOSIS DURING RESERPINE THERAPY

SIR,—In view of the attention recently drawn to the neurological complications of reserpine therapy, particularly the observations of Barsa and Kline,[1] Huchtemann and Pflugfelder,[2] and Stead and Wing,[3] on the development of extrapyramidal symptoms during the administration of this drug, the following case may be of interest.

A housewife, aged 54, had had no ill health, in spite of ten full-term pregnancies, until the age of 50. She then had frontal headaches, giddiness, dyspnœa on exertion, and palpitations, and she was admitted to this hospital with early hypertensive cardiac failure in 1952. Her blood-pressure averaged 220/130 during her stay in hospital. Retinal changes were slight and she was free from albuminuria. X-ray examination showed a typical enlarged hypertensive heart with pulmonary congestion. The electrocardiogram showed left heart strain and auricular fibrillation. She did well on digitalis, mercurial diuretics, aminophylline, and sedatives.

She was readmitted in June, 1955, with a recurrence of symptoms, and, in addition, nocturnal paroxysmal dyspnœa and hæmoptysis. Her condition on admission was substantially similar to that on her previous admission, but bilateral papilloedema with extensive retinal hæmorrhages and exudates were now present. Her œdema was more massive, she was cyanosed and congested, and heavy albuminuria was present initially but cleared later. Her blood-pressure was 240/145 on admission.

A salt-free fluid-restricted diet, in digitalis, full dosage mercurial diuretics, and intravenous aminophylline were prescribed and for the first time anti-hypertensive drugs were administered. 1·5 mg. daily (in divided doses) of reserpine ('Serpasil') was given and oral pentolinium tartrate, in increasing doses, until she was taking 150 mg. daily. On this régime the blood-pressure fell to 162/90 and her cardiac failure improved greatly.

Two days after the first dose of reserpine some twitching of her right hand was noted and she complained of severe epigastric pain and vomiting. The following day the muscular twitching had progressed to a typical choreiform movement now extending to her face, right leg, and thorax. Next day there was emotional instability, alternate weeping and giggling, and great restlessness. A severe generalised chorea with wild uncontrollable movements was now present. Writhing athetoid movements, particularly of the right hand, were associated with the typical athetoid position of the fingers and hand for long periods. Her epigastric pain was severe and vomiting was frequent. Apart from these involuntary movements no abnormal neurological signs were ever detected in her central nervous system.

Reserpine was stopped on the third day of therapy and all other drugs continued as before. The involuntary movements gradually subsided and had completely disappeared in fourteen days. Her emotional instability disappeared in a few days and her abdominal pain and vomiting within ten days. She made a good recovery from her cardiac failure in spite of this alarming upset and has remained in reasonable health in the last few months as an outpatient.

This case is instructive because of the small quantity of reserpine given before the onset of symptoms and the very real severity of the extrapyramidal symptoms.

A coincidental Sydenham's chorea was rejected as a cause for obvious reasons—the age of the patient and the absence of previous or concomitant rheumatism. A vascular cause is more difficult to reject, but the rapid disappearance of symptoms following the withdrawal of reserpine pointed strongly to its guilt.

Law Hospital, Carluke, Lanarkshire. A. MUIR.

CALCIFICATION WITHIN THE LIVER

SIR,—I have read with great interest the article by Dr. Smallwood and his colleagues (Aug. 20) describing a case of intrahepatic calcification of probable syphilitic origin. Since January, 1953, I have had under my care a young man in whom the healing of multiple hepatic gummata following treatment has been accompanied by the development of progressive calcification as seen in serial radiographs. A full report of this case will, I hope, be published in the near future.

Liverpool, 1. C. D. ALERGANT.

CONTINUOUS NARCOSIS

SIR,—It is reported in your issue of Aug. 13 that at a recent inquest Prof. J. M. Webster, speaking of continuous narcosis, said: "I think it is a very dangerous treatment. You pour barbiturates into a body. You don't know what happens to them, and you are living very dangerously when you employ massive doses of barbiturates."

I have been using this treatment extensively for over twenty years. In the earlier years, using 'Somnifaine,' I agree there were from time to time unpleasant complications. Since 1947 amylobarbitone sodium has been employed at this hospital, and well over 100 patients have been treated annually without unpleasant complications. The dose varies between gr. 18 and gr. 30 daily.

Reputable textbooks in edition after edition reiterate the dangers of this treatment. Maybe this is based on the experiences of early workers or perhaps on later experience on small numbers before the nursing staff were adequately trained. Further it is tentatively suggested that the physician has a better idea of what he is doing or may do than he has when he advises prefrontal leucotomy or even electroplexy.

St. Lawrence's Hospital, Bodmin, Cornwall. STANLEY M. COLEMAN.

1. Barsa, J. A., Kline, N. S. *J. Amer. med. Ass.* 1955, **158**, 110.
2. Huchtemann, K., Pflugfelder, G. *Schweiz. med. Wschr.* 1955, **85**, 627.
3. Stead, J. S., Wing, J. K. *Lancet*, 1955, i, 823.

PSEUDOMONAS INFECTION IN A UROLOGICAL WARD

SIR,—The article by Mr. Pyrah and his colleagues (Aug. 13) is timely in that it draws attention to the ease with which a *Pseudomonas pyocyanea* infection can spread through a urological ward, and the methods which may be necessary to eliminate it. In their drainage bottle, however, the air outlet may also act as an inlet for organisms. I would draw attention to a simple form of drainage bottle which I have used for more than three years (see accompanying figure).[1] Formalin vapour from the liquid formalin fills the tubing and the air inlet is guarded by a filter containing solid formalin. It is used for drainage in all cases after prostatectomy or whenever an indwelling catheter is required, and it has done much to reduce all forms of infection.

I am not in the habit of using "long-continued urethral catheterisation as a preoperative measure," but the same bottle can be used with a suprapubic catheter.

London, W.1. E. W. RICHES.

THE ÆTIOLOGY OF RHEUMATIC FEVER

SIR,—Many will regret with Dr. Schlesinger, whose remarks at the Royal Society of Medicine you reported on June 11, that no new light has been thrown on the pathogenesis of rheumatic fever since the streptococcus was inculpated some 20 years ago.

To me it has seemed a pity that the door has been shut to further inquiry by a misguided belief in single causes for diseases, which has caused the streptococcal theory to be universally accepted almost without question. Even in such an undoubtedly infectious disease as tuberculosis there are factors more important than infection by the bacillus which determine the incidence of the disease.

Those who see the streptococcus as an essential cause of rheumatism admit that there are other more important factors; but they argue that since this is the only one we know it is the only one worth talking about.[2] It is admitted also that 35 to 45% of first attacks of rheumatic fever are not preceded by any recognisable infection[3–5]; but these cases, it is argued, are so like the streptococcal ones that they must have had the same cause. Furthermore, the streptococcus is so ubiquitous that it is capable of getting through some portal of entry without being noticed.

Let us imagine that the same line of reasoning were applied to fractures of the tibial condyle. So many of these occur in pedestrians struck by cars that a keen student might well say that the ætiology of this fracture is a blow from a bumper bar. He might justifiably forget such other factors as condition of the patient's bones, his posture at the moment of impact, and the speed of the car. But he might become confused when he sees a patient who has fallen into his own cellar and sustained a fractured tibial condyle. He would have to agree that the ætiological factor was not a bumper bar but a certain kind of violence, of which injury by a bumper bar happens to be the commonest example.

It is true that rheumatic fever often follows throat infections in children—because that is the commonest infection which occurs in children. But 11 out of one series of 115 first attacks followed sprains and other non-penetrating injuries.[6] In 60% of adults the same disease follows injuries, operations, or infections, usually by organisms other than the streptococcus.[7–9] In the Libyan campaign sandfly fever, malaria, and furunculosis were the commonest causes.[10] In the tropics protozoal injections play their part.[11]

The ætiological factor, it seems to me, is damage to tissues, of which streptococcal infection is the commonest example in children. We should remember too that some 40% of cases in children and adults start without visible cause. The process which frequently requires infection or injury to set it off is capable of starting without any help.

Melbourne. MICHAEL KELLY.

MENTAL EFFECTS OF RESERPINE

SIR,—The letter on this subject by Dr. Macarthur and Dr. Isaacs (Aug. 13), and your leading article in the same issue, emphasise the hazards in the use of preparations containing *Rauwolfia serpentina* (and/or extracts therefrom). McGregor and Segal[12] underline these findings.

Yet I see that one of the reputable Sunday newspapers (and others, for all I know) advertises a preparation ('Tranquilex') containing as its active ingredient rauwolfia, for those who are "worried, irritable, anxious, tense," and who "sleep poorly."

The results of the public having open access to potentially dangerous drugs were seen in the case of methylpentynol. Are we not likely to see other tragedies where rauwolfia preparations are to be bought freely despite their known undesirable side-effects?

London, N.22. R. W. WATTON.

THE CURRICULUM

SIR,—Your leader last week suggested that "an outbreak of hysteria among final-year students" would do more than anything else to promote reform of the curriculum. You may be interested to know, that, in a survey of the behaviour of my class,[13] I found that this remained good until the fifth year, when the class began to behave during lectures in the childish manner characteristic of 15-year-olds. On questioning, 65 students out of 74 gave the following reasons for the decline in behaviour: (*a*) the course lasts too long; (*b*) the quality of lecturing is poor. Although other reasons were offered I believe these were the important ones.

I should hesitate to say that a state of hysteria existed in the class, but I would say that there was in some cases considerable friction between teacher and student, which resulted in loss of valuable time. It appears that the limit of tolerance was reached not, as suggested in your editorial, in the final year, but by the end of the fourth year. Any steadying effect apparent in the final year is probably due to the student's hope that, by sufficient work, he may free himself from undergraduate life.

As regards the reforms to be made, it may help if I present the problem as seen through a student's eyes.

1. Riches, E. W. *Practitioner*, 1952, **169**, 388.
2. Swift, H. F. *Amer. J. Med.* 1947, **2**, 168.
3. Eggleston, C. *Ibid*, p. 278.
4. Stollerman, G. H. *Ibid*, 1955, **17**, 757.
5. Catanzaro, F. J., Stetson, C. A., Morris, A. J., Chamovitz, R., Rammelkamp, C. H. jun., Stolzer, B. L., Perry, W. D. *Ibid*, p. 749.
6. Glazebrook, A. J., Thompson, S. *Edinb. med. J.* 1941, **48**, 674.
7. Manchester, R. C. *Arch. intern. Med.* 1946, **77**, 317.
8. Rosenblatt, W. H. *Kentucky med. J.* 1946, **44**, 228.
9. Kersley, G. D. *Brit. J. phys. Med.* 1946, **9**, 98.
10. Copeman, W. S. C. *Ann. rheum. Dis.* 1944, **4**, 11.
11. Morgan, J., Comroe, B. L. *Ann. intern. Med.* 1946, **24**, 233.
12. McGregor, M., Segal, N. *Brit. Heart J.* 1955, **17**, 391.
13. A report has been submitted to a student's journal.

First, I believe that time is often wasted on recapitulation or repetition. Secondly, the 2nd M.B. subjects should be considered as physiology only: both anatomy and pathology are subdivisions of physiology. Similarly all clinical subjects should be considered as a unit. Forensic medicine and public health could be discarded as subjects, and taught in their relation to the other subjects.

Finally, I would suggest that nobody should become a teacher until he has had adequate training in the methods of instruction.

ALBERT JACOB
5th year medical student.

REDUCTION OF OVERDRAFTS

SIR,—Everyone knows that the banks have been instructed to "get tough" with their customers' overdrafts and they appear to be already on the warpath. This is having unexpected effects in the field of preventive medicine. Already I am being called in to deal with problems arising from indiscriminate action by local bank managers and, if this action continues unsupervised, I anticipate a rise in the suicide-rate. I wonder if other of your readers have had similar experiences.

T. D. BLOTT
Medical Officer of Health.
Maldon, Essex.

ISONIAZID AND CLINICAL TRIALS

SIR,—In your leader of Aug. 13 you refer critically to the limitations of the conclusions drawn by Dr. Wallace Fox and Dr. Ian Sutherland in their report to the Medical Research Council's Tuberculosis Chemotherapy Trials Committee on the clinical significance of isoniazid resistance, and you suggest that this problem can only be solved by carefully planned and controlled investigations. It might not be apparent from these remarks that a major part of the report was, indeed, devoted to a discussion of the difficulties of solving this problem conclusively. Moreover, the design of an ethical investigation that could give a clear answer presents formidable difficulties.

You also state that the Medical Research Council's clinical trials in the chemotherapy of tuberculosis have been discontinued. While it is true that the intake was temporarily interrupted, the observations and analyses of the accumulating data have been published in a number of recent reports. Moreover, several fresh coöperative studies designed to answer pressing questions have been planned. One of these, on the incidence of primary drug-resistant tuberculous infections, is in progress and another, on long-term chemotherapy of chronic sputum-positive cases of pulmonary tuberculosis, is due to start shortly.

P. D'ARCY HART
Secretary, Medical Research Council's Tuberculosis Chemotherapy Trials Committee.
Medical Research Council Laboratories, London, N.W.3.

UNICEF

SIR,—In her article of July 23, entitled If I Were Director-General of UNICEF, Dr. Cicely Williams raised the question of how the resources of the United Nations Children's Fund can best be used to advance child welfare in economically underdeveloped areas. She suggested that UNICEF puts too much emphasis on the provision of supplies for mass campaigns against disease and instead should concentrate more on assessment of needs and training of skilled personnel so as to develop health programmes of lasting value.

How Unicef Policy is Made

The problem is not only the best use of limited international money, but also how this money can stimulate assisted countries to use their own resources to develop programmes for child care which they can eventually carry on themselves.

Projects are first worked out in the country requesting assistance; in this W.H.O. or F.A.O. personnel play a significant part. The recommendations are then passed on by the Executive Director, who in turn asks for the allocation of funds by UNICEF's Executive Board, comprising the representatives of 26 governments. All health programmes must have the technical approval of W.H.O., usually given by the W.H.O. Regional Office concerned.

The Executive Board has established criteria for projects which it can aid, and continually seeks the advice of the UNICEF/W.H.O. Joint Committee on Health Policy (a committee representing the Executive Boards of both bodies) as well as of the Director-General of W.H.O. and his staff. Each proposal is scrutinised to ensure that it represents a good use of money and that the government requesting the programme is able to provide its own share of funds, facilities, services, and personnel.

Use of Unicef Funds

Apart from emergency aid, which is already a separate category as Dr. Williams recommends, the Fund's aid has been mainly directed towards campaigns against such mass diseases as malaria, tuberculosis, yaws, trachoma, and leprosy; to the extension of elementary maternal and child-welfare services to rural areas; and to child-feeding and milk-conservation programmes.

Dr. Williams took the view that mass health campaigns claimed too high a proportion of UNICEF's funds, as opposed to programmes with far-reaching effects. Excluding operational and administrative costs, the breakdown of allocations since 1950 (the year when our terms of reference were changed from post-war relief to emphasis on long-range programmes in the economically underdeveloped areas) is as follows:

Allocations by Unicef Board 1951 to March, 1955

Emergency aid	$12,354,000
Maternal and child welfare	11,554,000
Mass health	16,235,000
Long-range feeding	2,941,000
Milk conservation	5,849,000
Freight	8,700,000

Long-range Feeding

The figure for long-range feeding understates the importance of this type of aid, for $3,670,000 of the freight charges have been for the transport overseas of skim-milk powder, obtained either free or at nominal price, 65,000 tons for long-range feeding and 67,000 tons for emergency relief.

Milk for long-range feeding is being given over a period of years to help countries start permanent school-lunch programmes and to reach infants, pre-school children, and nursing and pregnant mothers. The milk is the basis of nutritional education leading to better-planned diets and wiser use of locally available foods. The expenditure on milk conservation has helped countries carry on such programmes by equipping milk-drying and pasteurising plants (126 plants are already in operation), the bulk of the output being used for child-feeding programmes.

There are, however, many parts of the world, particularly in the tropics, where there is no prospect of providing an adequate milk-supply and UNICEF is examining, with F.A.O., other means of providing protein-rich foods such as fish flour and ground-nut or cottonseed flour. There is already under construction in Indonesia a plant which will produce "milk" from the soya bean.

The Mass Health Campaigns

In the health field the Fund has tried to direct its aid mainly to rural areas, not wishing to add to what is in many cases already a wide disparity between the standards of metropolitan and rural services. Further, it has worked on the broad principle that its limited resources could generally be better used for preventive than for

curative work; in this way, even with modest sums, large numbers could benefit substantially and major health problems could be solved and reduced to proportions controllable by the health services.

In the preventive field UNICEF has helped the economically underdeveloped countries apply on a large scale the insecticides and antibiotics which became available in the industrialised countries after the second world war, and which offer a means of revolutionising rural health conditions. More than half of the $16,000,000 listed above for "mass health" has gone for the control of malaria through the use of residual insecticides, and the control of yaws, bejel, and venereal diseases through penicillin. About one quarter has been allocated for B.C.G. anti-tuberculosis vaccination. The scale of the projects assisted, illustrated by the number of people reached during 1954 with material supplied by UNICEF is:

Malaria campaigns, people protected	14,500,000
Yaws, bejel, V.D. campaigns:	
People examined	16,000,000
People treated	3,000,000
B.C.G. vaccination:	
Children tested	37,000,000
Children vaccinated	13,000,000

In many countries assistance for such projects has had priority in time (though not in final importance) over assistance for the establishment of permanent rural health services. This has been done on professional advice, because it was necessary to clear away major endemic diseases before permanent health services could function effectively.

In Haiti, for example, the first substantial UNICEF assistance was for a campaign against yaws, the incidence of which is indicated by the fact that during the mass-campaign phase 1950–54, 38% of the population was treated as cases. The incidence of actual cases now varies between 0 and 0·8%. The remaining problem has been passed over to a system of surveillance, and the government was able to divert finance and personnel to another major problem, that of malaria eradication, which is now planned to be accomplished over the next five or six years. At the same time Haiti has begun on a preliminary scale to train personnel for rural health services. The main effort to extend these will be made after the malaria problem has been solved. That UNICEF is willing to assist through these three phases is the way we understand "far-reaching effects."

Mass health campaigns frequently offer possibilities in countries very short of professional personnel. The techniques can be taught as a drill, and auxiliary personnel can accomplish a great deal under professional supervision. A higher proportion of fully trained people is needed for permanent health services, and much can be done by the mass health campaign during the years required to train substantial numbers to man fixed health services.

I believe there will be general agreement with Dr. Williams that better health education, better understanding, and better care of children by their parents are the fundamental objectives. Nevertheless it is almost impossible for individual effort to deal with endemic diseases, and, on the other hand, effective modern drugs and insecticides can be made available. In fact, there is a good deal of evidence that one of the best ways to arouse individual interest and initiative is coöperation in a specific disease-control project, the objectives of which can be readily understood. In Thailand, as well as in some parts of Africa, successful yaws control has opened the way for a much more coöperative relation between the population and its health services—and the consequent extension of permanent health services.

Moreover it has been demonstrated that, when malaria or yaws is eliminated, the available health personnel will be in a position to devote time and attention to fundamental objectives instead of being swamped by problems of these diseases and their consequences in infants and children.

"Mass impact," which Dr. Williams considers a wrong objective, has not been sought on its own account but for substantive reasons.

We have considered it important, from the long-term point of view, that a project should be capable of being extended over the country as a whole, and have been chary of aiding projects which were so costly, in personnel or money, that they were likely to be restricted to a few favoured districts. We have tried to help countries solve major health problems systematically so that the way would then be open for the tackling of other ills. In most of the "mass health" programmes, complete coverage is a technical requirement for effective prevention—only in this way is the reservoir of infection reduced sufficiently. Malaria eradication requires that *all* houses be sprayed, over a large area. Yaws will come back unless substantially all clinical cases, latent cases, and contacts are treated.

All the diseases for which control projects have been aided have some specially significant relation with childhood. Malaria is a more important cause of infant and child mortality than of adult mortality. Yaws is usually contracted in childhood. Where general B.C.G. vaccination is desirable, it should be given in early childhood. Many of the control projects also benefit the rest of the population. The Children's Fund is more justified in helping them when they are well planned and on a sufficient scale to have the objective of preserving future generations of children from a particular infection.

Over the next five to ten years great interest will attach to the efforts to eradicate malaria which are now being planned on the American continent and elsewhere in some individual countries, with prospects for expanding into regional plans. The Executive Board of the Fund at its last session last March agreed to expand its aid to malaria projects for this purpose.

Aid for Maternal and Child-welfare Services

The $11,554,000 assistance so far allocated to maternal and child welfare in 74 countries and territories constitutes the second chapter of UNICEF aid to health projects. The first field of assistance was the improvement of midwifery at the village level. Mostly this means that the country offers some simple practical training for traditional midwives, while UNICEF supplies training aids, and an elementary midwifery kit for successful trainees—24,000 kits have so far been supplied. The hope was that midwifery, being a private service, could be improved in advance of the inevitably slow extension of permanent health services, which would add child care and other health services. In most countries, however, progress in training auxiliary midwives has been made only in areas to which the health organisation was extended.

UNICEF helps the extension of permanent rural health services first of all by aids for training, particularly in midwifery and public-health nursing, for both fully trained and auxiliary personnel. Assistance has been in the form of equipment for training-schools, assistance in setting up rural practice fields, and to a small extent stipends for trainees. In Asia 13,000 midwives and nurses are enrolled in 1955 for full-time training in schools aided by UNICEF, and 11,000 indigenous midwives are receiving short-term courses. Training of country personnel at a higher level for planning and supervision is aided through W.H.O.'s fellowship programme, and by UNICEF through some contribution to the equipment of training hospitals.

The technical equipment of rural health services is aided by simple sets of equipment for village maternal and child-health centres, which by the end of last June had reached 4700; and by the supply of drugs and diet supplements over a period of years which at the same date was reaching 5300 centres. The distribution of UNICEF milk through these centres encourages attendance and offers opportunities for instructing mothers in better

nutrition habits. Aid is now being expanded to cover the maternal and child-health aspect of the work at the various levels—village, supervisory health centre, and district headquarters—of a rural health unit or any other form of integrated health organisation. Maternal and child-welfare services should in time absorb more aid than mass health campaigns.

It will be seen therefore that UNICEF's function of aid to child-welfare projects has been broadly considered, and that the forms of aid are related both among themselves, and to aid particularly in the field of technical advice.

Technical Advice

I take Dr. Williams's second main argument to be that more resources should go for personnel and less for supplies. But the contributing governments have decided that it is the function of UNICEF to give material assistance, and of Specialised Agencies to give technical advice. They have further decided that each agency should be responsible for the financing of the functions with which it is entrusted. As far as UNICEF collaboration with W.H.O. is concerned, this decision was reaffirmed and clarified by decision of the UNICEF Board last March and the World Health Assembly last May. UNICEF works in a similar way with the experts of F.A.O. This division of function is no basis for the thesis that not enough assistance is being given for personnel.

Since the object is to aid child-welfare projects by supplying what has to come from outside the country, in most cases the supplies will naturally cost more than the experts. No conclusions can be drawn just from comparing the budgets of W.H.O. and F.A.O. with that of UNICEF. Moreover Dr. Williams speaks only of the regular budgets and leaves out of account the budget of the U.N. Technical Assistance programme, which has greatly augmented the financial capacity of the Specialised Agencies to provide expert advice. In 1954, for example, W.H.O. incurred $8,135,000 of obligations on its regular funds, and $3,755,000 on Technical Assistance funds (*W.H.O. Official Records* no. 62). Both sources of funds have since been increased.

Assistance for child-welfare projects broadly considered, as I believe they should be, comes from many sections of W.H.O. in addition to the specialist section on maternal and child health—which I, with Dr. Williams, would certainly like to see enlarged. She has pointed out the difficulties in the way of recruiting large numbers of international advisers with the experience and outlook that would make them effective helpers in underdeveloped countries. The number of people with this experience is increasing and we would like to see any means of accelerating the process encouraged.

E. J. R. HEYWARD
New York. Deputy Executive Director, UNICEF.

MEMOIR OF LORD HORDER

SIR,—The members of our family have been very much touched and pleased by the obituary notice which you recently published in honour of my father, the late Lord Horder, and we should like to express our thanks to you.

I want, in course of time, to put together a short memoir of my father's sayings and doings as his friends remember them, believing that he would have preferred this to a more formal full-length biography. It would be very helpful to me if doctors or nurses or others who have any detailed memories of him, at work or play, could find time to jot them down, date them, and send them to me. I am particularly interested in the first fifty years of his life, down to 1920. Any interesting letters will be copied and returned.

Ashford Chace,
Petersfield, Hampshire. HORDER.

Public Health

Poliomyelitis

UNCORRECTED notifications of poliomyelitis in England and Wales during the week ended Aug. 20 amounted to 348 (358), comprising paralytic 198 (194) and non-paralytic 150 (164). Figures for the previous week are in parentheses. Total uncorrected notifications this year up to Aug. 20, the end of the 33rd week, numbered 2226, compared with following totals for the corresponding periods of each of the years from 1947 to 1954: 2944, 990, 1753, 3536, 1631, 2169, 2845, 1252.

Food-poisoning in Derbyshire

An outbreak of food-poisoning at Belper, in which 20 people were taken ill, was traced to meat pies.[1] Staphylococcal contamination was thought to be responsible. Unsold pies were confiscated. Several hundred had been sold, but it was believed that only half a dozen were infected.

School Camp Closed

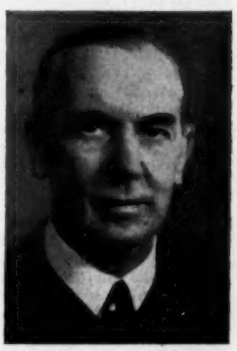
A school holiday camp near Ilkley has been closed because the only available water-supply—a stream and a spring—became contaminated after the drought.[2] In the first place, the water was chlorinated as a precaution, but despite this a few children got diarrhœa.

Obituary

ANDREW TOPPING

C.M.G., T.D., M.A., M.D. Aberd., F.R.C.P., F.R.S.E., D.P.H.

THE news of Dr. Topping's death will bring a sense of loss to many people in many countries with whom, and for whom, he worked. He was a man who stimulated and enlivened; and if his liking for something fresh prevented his using his talents as fully as might have been possible, it gave him an interesting life with a variety of considerable achievements—and a great many friends.



[*Elliott & Fry*

The son of Robert Topping, of the Scottish Education Department, and Robina Bayne, he was born on Dec. 20, 1890, and educated in Aberdeen at Robert Gordon's College and the university. Qualifying in 1914, he served with the R.A.M.C. in France, Gallipoli, and Mesopotamia, was mentioned in despatches, and reached the rank of major. (In the Territorials he afterwards commanded the 5th London General Hospital.) He then spent some years as senior medical officer with the Anglo-Persian Oil Company at Abadan before returning to England to take up public health. Junior appointments at Woolwich and in Lancashire were followed by his brief but memorable tenure of the post of M.O.H. for the county borough of Rochdale in 1930–32. Here, in what became known as the Rochdale Experiment, he used what was then a largely novel approach to a medical problem, displaying his powers as a coördinator by organising a joint attack on maternal mortality by the family doctor, the consultant, his own team of public-health workers, and the appropriate members of the public. Faced with an average maternal-mortality rate of over 8 per 1000 live births during the previous five years, he sought the help of a group of local doctors in ascertaining the avoidable factors leading to each maternal death. He set out to convince the public of the value of antenatal supervision; he advocated conservative treatment in confinements, with avoidance of instrumental intervention; he persuaded his council to provide better clinical and hospital

1. *Manchester Guardian*, Aug. 23, 1955.
2. *Ibid*, Aug. 25, 1955.

facilities such as a new maternity wing and new children's wards; and he succeeded in getting the coöperation of all concerned. All this energetic action was reflected in reduction of the maternal-mortality rate to 3·5 during the three years 1932–34. (This was, of course, in pre-sulphonamide days.) It was no surprise when an expert report declared that the "experience of Rochdale provides an impressive and valuable sample of an area which by deliberate effort has achieved a reduction in its maternal death rate by a method capable of being applied with success in other centres." In his approach to public opinion over venereal diseases he was equally bold; again he brought together all those interested, inviting representatives of the clergy and other key persons in the community to spread the gospel of preventive medicine.

To the officers of the London County Council it came as a surprise that the M.O.H. for Rochdale should apply for the position of medical superintendent of the Southern Fever Hospital, Dartford, which, though large, was mainly used as a standby hospital for the biennial outbreaks of measles and for convalescents. But, having entered the council's service, he was soon able, in September, 1933, to join its central staff as senior medical officer in the special hospitals branch which covered the whole immense range of fever hospitals, tuberculosis sanatoria and hospitals, children's hospitals, and the L.C.C. Laboratory Service. His outstanding ability in what are now called "human relations" was of particular value in a large service like that of the L.C.C., where the people working in the individual hospitals are apt to be overawed by the power wielded centrally and the remoteness of those who have to make major decisions. He was assiduous in visiting the hospitals and cultivating the friendship of the staff. He had a horror of red tape, rules, and regulations, and was never afraid of creating a precedent to meet some personal problem which had been brought to his notice. In the preparations that had to be made in case of war he played a big part, and in 1940 he was appointed deputy to Sir Allen Daley, the county medical officer of health. He threw himself with great energy into the difficult task of maintaining the L.C.C. health and hospital services throughout the war, including the time when bombs rained down every night and every L.C.C. hospital in London was eventually hit. He lived in a cellar at County Hall. His imperturbability, and even nonchalance, in the face of danger were an inspiration to all. When a land-mine fell on the terrace of County Hall causing many casualties, some fatal, he was first on the scene of the disaster and did yeoman service in attending to the injured. In the London Ambulance Service, expanded during the war by thousands of recruits, including many volunteers, he took a special interest, and he was given the title of director of the service.

Another piece of work which he found congenial and performed most ably was his survey, with Sir Archibald Gray, of the hospitals of Greater London. Usually accompanied by J. E. Pater of the Ministry of Health, they visited all the hospitals, and their report published in 1944 became a minor classic. On the other hand, when the worst experiences of the war were over, Topping, like so many other people, was sometimes irked by his routine duties—by having to appear before the finance committee and be cross-examined about the reasons for proposed expenditure. In 1944 an unexpected offer of the post of European director of UNRRA faced him with a major choice. Was he to remain with the L.C.C., with the probable reversion in due course of the chief's post, or resign and undertake international work which would possibly leave him without an appointment when it came to an end? For his decision to abandon security, one reason was no doubt the attraction of a new, less formal, task. But there was also another, at least as strong—his sense of duty. At the L.C.C. his quips and stories, which enlivened even the most serious meetings, are still recalled long years after his departure. But some of his colleagues became aware that under the light-heartedness ran a deep current of serious intent and a determination to do always, so far as he could, what was needed by his country. His strength was seen in the stoicism with which he met the tragic loss of a promising son.

If the L.C.C., at such a time, could ill spare so capable an administrator, the gain to UNRRA was perhaps more important. Although Topping lacked previous international experience, his good fellowship and capacity to get on with all his subordinates was an immense help in trying to get the best out of an ill-assorted staff of over 1000, of more than thirty different nationalities, with a very wide range in quality. The confidence he inspired in his non-medical colleagues can be judged by his promotion in 1945 to the post of assistant director of relief services at UNRRA's European regional office, which widened his field to include welfare in addition to health. In both capacities his duties took him to many parts of the world, including Egypt, Greece, Italy, and Germany. Wherever he went, relations improved and the work went on more smoothly. His Aberdonian origin and delightfully told Scottish stories certainly helped to dispel the faint mistrust felt by some Americans for their pure-bred English colleagues. Before he left UNRRA, he was able to take a hand at the birth of the new era in international health work at the meeting, in 1946, of the Technical Preparatory Committee, out of which W.H.O. eventually emerged—a meeting at which he aptly compared UNRRA to a mule, "a useful animal but with no pride of ancestry nor hope of posterity." The work achieved under his leadership is described in his excellent paper entitled European Health Problems: UNRRA's Part in Controlling Them.[1] In the same year he was elected F.R.C.P.

After five months spent at the Ministry of Health, helping to form the regional hospital boards, Topping was in November, 1947, appointed first professor of preventive and social medicine in Manchester. He had previously lectured in public health at Charing Cross Hospital, and examined at the Universities of London, Aberdeen, Durham, and Belfast, as well as for the Conjoint Board; but when he became professor there was no D.P.H. course in Manchester; and, though his knowledge of hospital administration was put to good use by his belonging to the board of governors of the Manchester teaching hospitals and presiding over one of its institutions, he did not settle quite happily into his chair. In March, 1950, he came south again to be the first whole-time dean of the London School of Tropical Medicine, and in this post he again displayed his skill in getting different kinds of people to work together. Here, as so often before, his buoyant nature coupled with Scottish wit enabled him to cope with many difficult problems without causing ill-will. He showed warm interest in the students at the school and also kept in touch with former students, forming a very successful students' association, to whose reunions he was able to collect people from a wide area. His colleagues at the school will long miss his cheery company, and many a student will long remember the trouble he took to enter into their individual difficulties, and the sage counsel he gave them. He was also much concerned to develop the world-wide associations of the school, whose importance he appreciated. Having previously visited West Africa he last year went to the East African territories at the request of the Colonial Office. He was a member of the Colonial Medical Advisory Committee and of the University of London's Committee on Higher Education in the Colonies. His services in these ways to the Commonwealth were recognised in 1954 by his appointment as C.M.G.

In 1952 his former colleagues made him president of the Society of Medical Officers of Health, and he delivered a characteristically provocative address. In Service medicine he played his part as a member of the Army Health Advisory Committee. And in the National Health Service he was chairman of the Archway Group Hospital Management Committee.

"Andrew—the Christian name came naturally after brief acquaintance—was seen at his best by those under him. His astonishing memory for names and faces, his sympathy and loyalty to his subordinates, the zest with which he welcomed some old acquaintance who turned up unheralded in his office, combined—until the motor-smash in West Africa and the last few tragic months—to give the impression of a much younger man. Had he lacked courage to express his views at times with a frankness that shocked, had he (above all)

1. *J. R. sanit. Inst.* 1946, **46**, 91.

been less restless and more settled, the mark he has left on preventive medicine and the public health might have been deeper—it could hardly have been more wide. But then he would not have been the Andrew Topping we knew and loved."

Dr. Topping married Freda Wood, who survives him with a son and a daughter.

ERNEST WILLIAM AINLEY-WALKER

M.A., D.M., D.Sc. Oxfd.

Dr. Ainley-Walker was one of those happy few who developed the Oxford medical school, carrying on the high standards set by Henry Acland and Burdon-Sanderson. From early days he was marked for distinction: educated first at Kingswood and Rydal, he went to Christ Church as a scholar, proved his ability as a mathematician, and took a brilliant first in physiology in 1894. After a period as assistant demonstrator of physiology, he secured the Price entrance scholarship at the London Hospital, and having qualified in 1899, held house-appointments there. For a couple of years he was abroad as Radcliffe travelling fellow, and it was in Zürich in 1900 that he began the investigations, especially on immunity and inflammation, that established his scientific reputation. In 1902 he was appointed Gordon lecturer in experimental pathology and director of the pathological department at Guy's Hospital, and in 1905 he continued his pathological studies as Gillson scholar of the Society of Apothecaries of London. Meanwhile, in 1904, he had become a tutorial fellow of University College, Oxford, and the possibilities of the new pathology department there appealed to him so much that soon he settled permanently at Oxford, where his assistance was of great value to James Ritchie, the first Oxford professor of pathology. When Ritchie went to Edinburgh in 1907, Ainley-Walker might well have been his successor, but the lot fell on Georges Dreyer of Copenhagen. At a time when Ainley-Walker might have shown disappointment or have sought a professorial chair elsewhere, he not only welcomed the new professor but gave ungrudging help in initiating him into Oxford ways and customs, continuing to be his warm supporter. He collaborated with Dreyer in many of his researches—notably on agglutinins, on the estimation of blood volume, and on adaptation to diminished oxygen tension—and they produced some thirty papers together. Moreover, as Dreyer frequently acknowledged, he was a tower of strength in the work of the department. When Dreyer was out of this country for several years during the first world war, Ainley-Walker took charge of the department, as he did again, with the title of deputy professor, in the interregnum between Dreyer's death in 1934 and Sir Howard Florey's occupation of the chair. He was thus professor in all but name for nearly five years.

Outside Oxford he was known as an examiner in pathology in the universities of Cambridge, Sheffield, and Leeds. A Yorkshireman on both sides of his family—he was born at Doncaster on Jan. 27, 1871, the son of the Rev. W. H. Walker—it was a source of great satisfaction to him to serve as external examiner in both the Yorkshire universities. "As a very youthful professor," writes M. J. S., "I could not have had a better mentor. A gentle, friendly, and considerate examiner, most just in his decisions and never rattled, he treated the candidates as fellow scientists—almost. I was not surprised at the place he held in the regard of his pupils."

The expansion of the Oxford medical school after the first world war made it necessary to have a medical dean, and to this office Ainley-Walker was appointed. The additional work must have been a serious burden for one who still held his post in the pathology department and his tutorial fellowship. But he did not allow these duties to prevent him from maintaining contact with recent Oxford students doing their clinical work in London; he organised monthly informal dinners for them at a Soho restaurant and made a point of coming up to London for the evening to hear how each was faring. This is an example of the great interest he always showed in those who had passed through his hands. His kindness and thoughtfulness for others were outstanding, and countless Oxonians thought of him with affection.

A. D. G. writes:

My first real contact with Dr. Ainley-Walker was in 1904 when, as a law student at University College, Oxford, I sought urgent advice from the medical fellow of the college whether it would be possible for me to start the premedical course the following autumn after having taken my law-schools, and whether I could complete the premedical and preclinical courses in three years. His reactions showed me at once the kind of man he was: obvious pleasure at gaining a recruit for medicine from the law; keen interest in the personality of a future pupil; sympathy and tact in inquiring about the intellectual and economic potentialities of my project; and the rapid and resourceful production of a close-packed programme, through which he would be most happy to help me, provided that I was ready to work like a nigger. He felt no dismay at my confession that I had done no science at school; and in the event he coached me most lucidly in elementary chemistry; easing my early struggles with atomic weights or parallelograms of force, and redirecting my slight acquaintance with the laws of Man towards the more exciting study of the laws of Nature. From that first interview I came away with the kind of exaltation that I imagine a man feels when he unexpectedly comes into a fortune; my programme was possible, and I had found a friend and helper of the first order.

On my return to Oxford in 1915 to run a military-supply laboratory under Professor Dreyer I had the opportunity of collaborating with Ainley-Walker in many bacteriological researches, mostly on enteric fever; and I received great benefit from his guidance, for his scientific work was not only painstaking and meticulous but also highly original. It has indeed always been my belief that if he had been more ambitious and circumstances more favourable the mark he made would have been much greater. As it was, he made a massive aggregate of first-rate contributions to physiological and bacteriological pathology, and he was thoroughly contented with his full life of teaching honours physiology to his "Univ." pupils and of lecturing and demonstrating in the University Department of Pathology. He did all these things extremely well, and I am sure that all his old pupils will feel saddened by the loss of a most gifted and respected friend.

One such pupil, R. J. B., recalls a day early in 1917 when he was sitting for an entrance scholarship at University College:

The friendly little man who came and spoke to me was then in uniform, and I remember wondering how an Army officer could be such an unmilitary and informal person.

FFiendliness and informality were perhaps Dr. Ainley-Walker's most striking characteristics to those who were privileged to be his pupils—and indeed to others, for he had a wide undergraduate acquaintance.

The tutorial, an hour after hall once a week during term, was something of a revelation. The fresher, perhaps expecting a stern attitude, at once found that here was a don who disarmingly put him at his ease, and this happy relationship was maintained on all occasions. The student was "smoked at" in the way described by Stephen Leacock; but Ainley-Walker's smoking consisted, not of a pipe, but of an almost continuous series of crudely rolled cigarettes, made while he was speaking; one's attention was often riveted to the cigarette at crucial moments in its smoking—would it break into two or would it go out? In the days of match shortage in the first war a burning night-light was indispensable in "Ainley's" room during his tutorial sessions.

It was uncommon for a tutorial hour to be devoted entirely to "shop." Sooner or later Ainley-Walker would open up a current topic which he felt had some significance for his pupil; for he was interested in the whole student, and the student's interest was his concern.

Another tribute is to like effect:

It seems to be in middle life (writes A. W. D. L.) that a medical man first realises the extent to which he has been

influenced by his early teachers; but by this time memory has become mercifully selective and the focus is sharp only upon those few personalities from the past who for one reason or another earned our devotion. It is inconceivable, however, that a single member of that large band of one-time pupils of the late Dr. Ainley-Walker will at this moment find any difficulty in recalling a vivid picture of that kindly little man with the twinkling eyes who was tutor to so many Oxford medical students and friend to them all.

Viewed with the eyes of extreme youth, Ainley-Walker even in the '20s seemed elderly; but how false was this impression. One did not have to know him long to realise the perpetual struggle he had to restrain the boyish spirit which lay within. Sometimes this got the better of him, and what a revelation it was after a college "bump" supper to encounter one's revered tutor with a gleam of sheer delight in his eye, organising the defence of the college gate against marauders from a neighbouring college.

His academic career was distinguished, and his contribution to pathology considerable; but the impression he leaves upon a succession of Oxford medical students, and in particular upon those from his own college, is likely to be that of a man who had found contentment both as a family man and in the serene and tranquil life of a don, who genuinely enjoyed the society of young men, and whose simplicity and sincerity represented the best kind of influence on undergraduate life.

As a tutor Ainley-Walker never badgered his pupils; but even the hardest sinners were liable to find themselves working to please him. If in later life success of any kind came their way, this did not escape the eagle eye of their old tutor; indeed to many it seemed uncanny that he should be so well informed of their careers. No, he never forgot us, nor are we likely to forget him.

In London Ainley-Walker had a long and honourable association with the Society of Apothecaries, whose licence he had taken on being appointed their Gillson scholar in 1905. He became in turn yeoman, liveryman, member of his court of assistants, and in 1940 junior warden. But unhappily, before reaching the master's chair, he had to resign, in 1943, because of illness.

Bad health had already obliged him to give up his Oxford work, and he had gone to live at Upavon in Wiltshire. But though, in succeeding years, his physical condition inexorably deteriorated, his attitude was philosophical, his mind was clear, and the visitor found the same twinkle in his eye. "What a grand man he was, to be sure," writes one. Another friend, A. S. MacN., looking back over the achievements of this long life, sums them up in the words: "He was a great man, but often stood aside to let others reap the harvest he had sown. The debt that Oxford medicine owes him is incalculable."

Dr. Ainley-Walker's first wife, who died in 1917, was the daughter of Sir Edward Poulton, F.R.S. In 1919 he married Inez Elizabeth, daughter of Canon J. H. Skrine, D.D., and she survives him with their son and two daughters, two of whom are members of our profession. He died at Upavon on Aug. 15.

FREDERICK ALEXANDER ETHELBERT SILCOCK
M.D. Belf., D.P.H.

Dr. Silcock died on Aug. 2 in the Leicester Royal Infirmary, which he had served for many years.

Born in 1892, the son of the late Colonel A. Silcock, I.M.S., he was educated in this country. Ill health in youth and early manhood turned him from an Army career, and in 1915 he graduated M.B. at Queen's University, Belfast. After holding resident posts in Northern Ireland and in Norfolk, he was appointed medical superintendent at the Leicester Isolation Hospital. In 1925 he took his M.D. degree, and soon afterwards he began to specialise in dermatology. In 1934 he was appointed to the honorary staff of the Leicester Royal Infirmary, and later he became dermatologist to the City General Hospital.

Essentially a practical man, he had a wide knowledge of many industrial processes, and he was keenly interested in occupational dermatitis. He was a member of the panel for industrial dermatitis, under the Ministry of Labour, during the late war. He was also one of the first British dermatologists to investigate the properties and value of water-miscible bases, and this special knowledge gained him a place on one of the committees of the British Pharmacopœia Commission. For many years he was a regular and welcome visitor to St. John's Hospital for Diseases of the Skin in London, and for a time he sat on the council. When in 1950, owing to failing sight, he retired from his hospital work he was appointed emeritus physician (dermatology) to the Leicester Royal Infirmary, in recognition of his services.

J. O. writes: "Dr. Silcock's ultimate blindness was a heavy blow, for his work and hobbies especially demanded the power of sight. He will long be remembered by friends for his puckish humour, his kindliness, and warm hospitality. His nursing staff recall with affection his cheeriness, assiduity, and sympathetic understanding. His associates miss an unobtrusive, gentle, but firm, loyal colleague."

Dr. Silcock leaves a widow.

JAMES BONNELL HOWELL
M.R.C.S., D.P.H.

Dr. Howell, who died on Aug. 10 at the age of 77, trained at University College, Cardiff, and University College Hospital, London, and qualified in 1905. His undergraduate successes included the award of the Liston gold medal in surgery and the gold medal in midwifery. He took the D.P.H. in 1911 and became medical officer of health of Hammersmith in 1914, occupying that office with distinction until his retirement in 1942. He belonged to the generation of public-health workers who saw the final consolidation of environmental medicine and the firm establishment of the personal health services. Under his guidance the maternity and child-welfare services of the borough were built up to a high level, and the tuberculosis service was placed on a firm foundation. When the latter was rendered homeless as a result of enemy action, it was largely through Howell's insight and persistence that it was rehoused, by the London County Council at Hammersmith Hospital, where it has continued to flourish in the new era. For many years he lectured in public health at the West London Hospital, and with the late Dr. H. R. D. Spitta shared the teaching in that subject at St. George's Hospital Medical School. Throughout his career he was a constant attender at meetings of the Society of Medical Officers of Health.

Quietly genial and quietly gregarious, Howell was a liveryman of the Society of Apothecaries and a freemason. Proud of his nationality, he also played his part in various Welsh societies in London. He married rather late in life and leaves a widow and a son and daughter, both of whom are studying medicine.

THE LATE LORD HORDER

S. C. L. writes:

It cannot be more than four weeks ago that a dapper figure, briskly jumping out of his car, waved to me, and, as we approached within reasonable distance, I recognised Lord Horder. Did his sight or memory ever fail; did he ever forget a patient or doctor? His diagnosis was worth a sheaf of pathology reports, his reassurance often half a year of psychotherapy. Unique among consultants of my experience, he would frequently phone to ask about the progress of a patient he had seen.

Sagacious, confident, and erudite, he held his opinions strongly and could be scathing, outspoken, and not a little unorthodox, as when he scolded for seeking sigmoidoscopic confirmation of a diagnosis of ulcerative colitis—this in the presence of an amazed and bewildered patient. But the next week, he could take your arm at a great public dinner (I think he enjoyed these functions) at the Trocadero; and, as the partition wall to the Cocktail Lounge parted, dramatically revealing the vast banqueting-hall beyond, he exclaimed "The Walls of Jericho!"

For the last five years, he was president of the Institute for the Study and Treatment of Delinquency, at which small group he presided regularly and meticulously when so many more "important" and distinguished gatherings might have claimed his time.

It used to be said of him that no eminent person was allowed to die before Horder had been called in to give his assent. Can one hope that before he joined his celestial peers, the Archangel graciously acceded to him this last right?

Notes and News

CAMPAIGN AGAINST CAPITAL PUNISHMENT

A National Campaign for the Abolition of Capital Punishment has been launched by an executive committee consisting of Victor Gollancz (chairman), Canon L. John Collins, Gerald Gardiner, Q.C., Ruth Gollancz, Christopher Hollis, Arthur Koestler, Frank Owen, Reginald Paget, Q.C., M.P., and Mrs. Peggy Duff (secretary and treasurer).

An initial statement explains that the campaign will employ two methods. The first of these will be educational. Books, pamphlets, and shorter statements will be issued; public meetings will be organised; and personal contact will be established with all who wish for information on the issues involved. But the campaign will also be concerned to give those members of the public who are already opposed to capital punishment an opportunity for expressing their conscience in this matter.

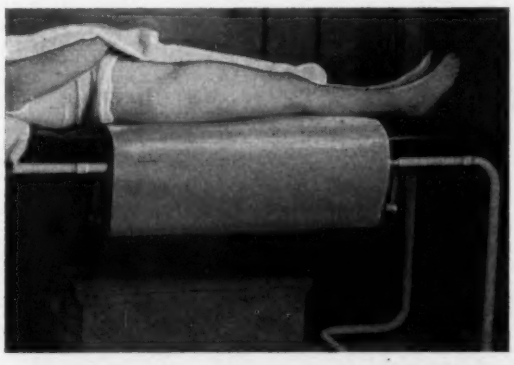
"We shall suggest, for instance, that abolitionists may think fit to abstain from attending any place of entertainment, or any party, on the evening preceding an execution, and may further think fit to attend, during the night preceding an execution, a place of worship or assembly (and we shall arrange for such places to be open for the purpose). Shopkeepers and owners of businesses who are opposed to the death penalty may wish to shut their premises for an hour or so during the day preceding an execution (where no public inconvenience would be caused) and to display a notice explaining their reason for doing so. Other projects are under consideration."

Any disruptive or sensational action, such as demonstrations outside prisons, will be rigorously discountenanced.

The committee appeals to all who are in sympathy with its aims to send a contribution, however small (but as large as possible), to the treasurer, Mrs. Peggy Duff, at its London address, 14, Henrietta Street, W.C.2. Sympathisers who are unable to contribute are asked to send a *postcard* to Mrs. Duff, putting on it nothing but the word "abolitionist," and the name and address of the sender in block capitals.

HYGIENIC ATTACHMENT FOR OUTPATIENT COUCH

Mr. T. B. Fitzgerald, M.B.C.O.G., writes: It is obviously desirable to maintain the highest possible hygienic standard in a busy outpatient department, though the sterility of an operating-theatre is neither possible nor necessary. The accompanying figures show an arrangement which provides a clean fresh surface for each patient by the use of a 4-foot-wide paper roll which is wound across the surface of the examination couch on to a spool on the other side of the couch, in the same way as a roll-film in a camera. The illustrations show a gynæcological patient in position for examination and turning to descend from the couch. The unavoidably close contact between the couch and the ano-genital region emphasises the necessity for a fresh surface for each patient. The cost of the rolls of paper used is considerably less than that of a change of linen for each patient and in spite of the initial capital outlay, this arrangement has, therefore, economic advantages also.



The attachment shown has been in use at the Ashton-under-Lyne General Hospital for some time with satisfactory results. The manufacturers are Messrs. C. F. Thackray Ltd.

TROPICAL HYGIENE

PREVENTION of disease in the tropics, to which the Ross Institute is dedicated, must once have appeared an impossibly vast assignment; yet even in the past few decades it has shrunk to dimensions which are almost manageable. This change has been wrought largely by the development of the synthetic residual insecticides, especially 'D.D.T.' (dicophane), 'Gamma B.H.C.' (gamma benzene hexachloride), and 'Dieldrin,' which have proved highly destructive to the vectors of malaria, filariasis, yellow fever, sand-fly fever, kala-azar, Chagas's disease, relapsing fever, typhus, scrub typhus, trypanosomiasis, and others—including the host of disorders which the common house-fly is suspected or known to carry around on its feet. One self imposed task of the Ross Institute is to keep those interested informed of the most recent methods of disposing of these and other pests, and to describe in detail how they should be used.

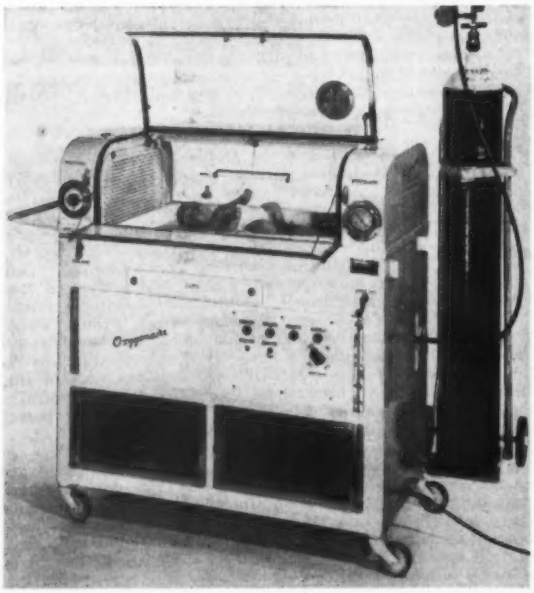
The first *Bulletin* of the industrial advisory committee of the Institute, published in 1949, took residual insecticides as its subject. It was totally revised in 1952, but weapons against insect vectors develop almost as rapidly as weapons for greater wars, and the committee have found a fresh account to be necessary. Written by Mr. G. Davidson, B.SC.,[1] himself responsible for much work on these insecticides, it is a model of exposition, dealing with the practical application of the insecticides, their various forms, the vulnerable insects, and the ways these can best be controlled. Though written for medical readers, the pamphlet is also being distributed to non-medical readers; for, as Prof. George Macdonald, director of the Institute, points out in a foreword, malaria control is very largely and properly carried out by non-medical people, who need a good understanding of the range of available insecticides and their properties.

A companion piece to this, but written for laymen, is a *Bulletin* on clean water-supplies, by Dr. R. Ford Tredre.[2] Roughly speaking, water is only dangerous when contaminated either directly or indirectly by human excreta, the main diseases transmitted in this way being cholera, the typhoid group of fevers, and the dysenteries. Organisms derived from the excretions of animals do not usually cause disease in man, but there are exceptions, such as leptospirosis, transmitted in the urine of rats. In some tropical countries, moreover, water-supplies contain the eggs or larvæ of parasites—such as bilharzia and guineaworm—which infest man. Surface waters are polluted everywhere, and this well-written and well-illustrated pamphlet deals mainly with methods of obtaining good subsoil water by properly constructed wells, methods of filtration, storage, and chlorination. Dr. Tredre notes that in villages in the tropics and subtropics infection and reinfection with diseases transmitted by water are so usual that these are virtually diseases of childhood, and people become relatively immune to them. They are still, however, susceptible to a superinfection, such as may come from sudden gross contamination of the water-supply. Relatively straightforward and inexpensive methods against such risks will get rid of explosive epidemics of these diseases. In the circumstances, he says, "the attainment of a degree of purity of water expected in temperate climates is unnecessary and uneconomical." The advance towards cleaner water, in fact, can only be made in step with advances in agriculture, education, and personal hygiene.

1. Residual Insecticides. Industrial Advisory Committee of the Ross Institute, Bulletin no. 1. London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. Pp. 31. Supplied on application to the Secretary of the Ross Institute.
2. Water. Bulletin no. 10. Pp. 31. Supplied on application to the Secretary of the Ross Institute.

MODIFICATION OF AN INFANTS' INCUBATOR

Dr. Hugh Jolly writes: "The illustration shows a standard 'Oxygenaire' incubator in which the front panel has been altered so that it is no longer fixed but can be opened outwards. This alteration gives easier access to the child and was particularly planned for use during exchange transfusion, in which babies so easily lose heat. Once the umbilical catheter is in position, the lid can be closed, and any attention necessary can be given through the side opening. The baby may still be



placed on a 'crucifix' if desired, and if this is done the tray should be removed to allow of more room." In making this modification Dr. Jolly has had the help of Mr. A. E. Maynard, of the Exeter Oxygenaire Depot.

University of London

The title of professor emeritus of pathology has been conferred on Dr. J. H. Dible, professor of pathology at the Postgraduate Medical School of London. Mr. G. W. Taylor has been appointed to the readership in surgery, tenable at St. Bartholomew's Hospital Medical College.

University of Louisville, Kentucky

Dr. Frank Falkner has been appointed assistant professor of child health in this university, from January, 1956.

Dr. Falkner is at present lecturer in child health at the Institute of Child Health, The Hospital for Sick Children, Great Ormond Street, London, and research assistant to that hospital. He is also coördination officer to the Centre Internationale de l'Enfance, Paris, for their coördinated growth studies. These studies taking place in different countries have, as yet, no North American member of the "group." Dr. Falkner is to set up such a coöperative growth study in Kentucky, and he will keep his appointment in Paris.

Royal Society of Health

The following meetings have been arranged:

Thursday, Oct. 13, at 10 A.M., at the Municipal Technical College, Bury.—Mr. C. B. Roberts: Treatment of Gaseous and Liquid Effluents from Manufacture of Regenerated Cellulose Film. Dr. K. K. Wood: Promotion of Health.

Monday, Oct. 17, at 2.30 P.M., at the Caxton Hall, Westminster, S.W.1.—Sir Hugh Beaver, Dr. J. A. Scott: The Clean Air Bill.

Wednesday, Nov. 16, at 10.30 A.M., at the society's headquarters, 90, Buckingham Palace Road, London, S.W.1.—Discussion on the Design of Health Buildings.

Wednesday, Dec. 14, at 2.30 P.M., at the society's headquarters.—Sir Weldon Dalrymple-Champneys: Vaccination against Poliomyelitis.

Army Appointment

Dr. R. F. Tredgold has been appointed honorary consultant in psychiatry to the Army at home in succession to Dr. J. R. Rees, who has relinquished the post on reaching retiring age.

International Congress of Internal Medicine

This congress will be held in Madrid from Sept. 19 to 23 next year under the presidency of Prof. C. Jiménez Diaz. The principal subjects chosen for discussion are: the rôle of the adrenals in the pathogenesis and evolution of internal diseases; and bronchial asthma and emphysema. Further information may be had from Dr. J. C. de Oya, Hortaleza, 90, Madrid.

International Society of Plastic Surgeons

This society was formed at the First International Congress of Plastic Surgery, held in Stockholm and Uppsala on Aug. 1–5. The following officers were elected:

Hon. president, Sir Harold Gillies; general secretary, Tord Skoog (Sweden); treasurer, Karl Erik Hogeman (Sweden); executive committee, Truman Blocker, jun. (U.S.A.), Francis Burian (Czechoslovakia), Mario González-Ulloa (Mexico), Sir Archibald McIndoe, Daniel Morel-Fatio (France), Gustavo Sanvenero-Rosselli (Italy), Karl Schuchardt (Germany).

International College of Surgeons

Meetings of the college have been arranged in Philadelphia (Sept. 12–15), Belo Horizonte, Brazil (Oct. 12–16), Vienna (Oct. 22–23), Mendoza, Argentina (2nd Panamerican congress, Oct. 22–26), Tokyo (Oct. 30), and Amsterdam (Nov. 18–20).

Awards in Radiological Research

On behalf of the James Picker Foundation, the National Academy of Sciences-National Research Council announces that funds in support of radiological research are still available. Awards are not limited to citizens of the U.S.A. Applications for the fiscal year 1956–57 must be submitted by Dec. 1. Further details and application forms may be obtained from the Division of Medical Sciences, National Academy of Sciences-National Research Council, 2101, Constitution Avenue, N.W., Washington 25, D.C.

Inquiry into Faulty Poliomyelitis Vaccine

Last April six lots of poliomyelitis vaccine manufactured by the Cutter Laboratories were found to contain live virus (see *Lancet*, 1955, i, 956). The United States Public Health Service has ascribed this mishap to failure of its safety tests (*New York Times*, Aug. 26, 1955). The report does not blame the Cutter Laboratories, nor does it recommend revocation of the concern's licence. It states that the exact reasons for the presence of "ineffective amounts" of virus in Cutter vaccine could not be found; that nothing pointed to contamination in the plant; and that the data suggested "inadequacy of virus inactivation" and "failure of safety tests." Dr. Leonard A. Scheele, the surgeon-general, pointed out that the incident had led to revision of the safety requirements.

Serotonin (5-hydroxytryptamine, enteramine) is now available commercially in the form of its sulphate double salt with creatinine from Messrs. May & Baker Ltd., Dagenham, Essex, for use in physiological and pharmacological research.

Appointments

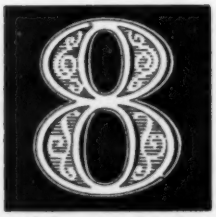
DAWSON, LESLIE, M.B. Manc.: registrar in diseases of the chest, Bristol Chest Clinic and associated hospitals.
GATHERER, ALEXANDER, M.B. Aberd.: senior asst. M.O.H., and deputy principal school M.O., Warrington.
HODGSON, J. H., M.B. Sydney: surgical registrar, Bath group of hospitals.
HOWELL, F. R., M.B. Lpool: asst. M.O.H., Liverpool.

Appointed Factory Doctors:

ALEXANDER, HARRY, M.B. Edin., D.P.H.: Tooting, London.
HUMPHREYS, R. C., M.D. Edin., D.OBST.: Crickhowell, Brecon.
PHILLIPS, H. G., M.R.C.S.: Farningham, Kent.
POSNER, JOSHUA, L.R.C.P.I.: Dewsbury, Yorks.

Colonial Appointments:

CLEAREIN, P. M., M.B. Belf.: M.O., Kenya.
COELLO, A. J., M.D., D.P.H.: M.O., grade A, physician, Trinidad.
COX, J. H., M.B.: M.O., Uganda.
DOYLE, V. T. B., M.D. Dubl., M.R.C.P.I.: M.O., Northern Region, Nigeria.
FREEMAN, LEONARD, L.M.S.S.A., D.M.R.E.: senior radiologist, Trinidad.
GOSLING, R. H., M.B. Edin., M.R.C.P.E.: M.O., grade A, physician, Trinidad.
HURLY, M. G. D., M.B.: resident M.O. (intern), Kenya.
JOANES, R. F., M.B.: M.O., Aden.
KOBLENZER, P. J., M.B. Lond.: M.O., North Borneo.
MCDONALD, K. A., M.B. Glasg., D.OBST.: M.O., North Borneo.
MCNEICE, GRAHAM, M.B. Belf.: rural M.O., Northern Region, Nigeria.
PARSONS, R. S., M.B. Durh.: pathologist, Federation of Nigeria.
SHILLINGFORD, D. C., M.B. Aberd.: district M.O., Dominica, Windward Islands.
SMITH, D. M. W., M.B.: M.O., Uganda.



ADVANTAGES of 'SICCOLAM'

THE B.D.H. DESICCANT PASTE

★ Active in all inflammatory dermatoses
★ Effects immediate adsorption of fluid exudate
★ Promotes rapid relief of inflammation and pruri us
★ Active in both acute and chronic conditions
★ Can be used in conditions in which the use of fatty preparations is contra-indicated
★ Completely innocuous; there are no contra-indications to its use
★ Simple and cleanly in use ★ Dries rapidly

'SICCOLAM' TRADE MARK

DESICCANT PASTE

Contains titanium dioxide, zinc oxide, kaolin and chlorphenesin in a fat-free basis.

Basic N.H.S. prices: Tubes of 2 oz. at 1/4, 4 oz. at 2/2 and containers of 1 lb. at 6/6

Fully descriptive literature and specimen packings are available on request.

THE BRITISH DRUG HOUSES LTD. (MEDICAL DEPT.) LONDON N.1

SIC/B/541

The night passes serenely to a fresh awakening...

Since the original synthesis of 'Amytal' over thirty years ago, Eli Lilly & Company has been closely associated with the further development of the barbiturates. To-day, as a result of further research by Lilly, the physician has an extensive range of barbiturates from which to choose the drug most suited to his case.

Included in the Lilly range of Barbiturates are

Barbiturates

Lilly TRADE MARK

'Pulvules' *brand* filled capsules.
'SECONAL SODIUM'
brand Quinalbarbitone Sodium.
Quick onset — short duration.
gr. ½ and gr. 1½.

'SODIUM AMYTAL'
brand Sodium Amylobarbitone.
Medium onset — medium duration.
gr. 1 and gr. 3.

'TUINAL'
brand Quinalbarbitone Sodium with Sodium Amylobarbitone.
Quick onset — medium duration.
gr. 1½ and gr. 3.

Tablets
'AMYTAL'
brand Amylobarbitone.
Medium onset — moderately long duration.
gr. ½, gr. 1, gr. 1½, gr. 3 and gr. 1½.

ELI LILLY & COMPANY LIMITED, BASINGSTOKE, ENGLAND

USE GOOD BOTTLES

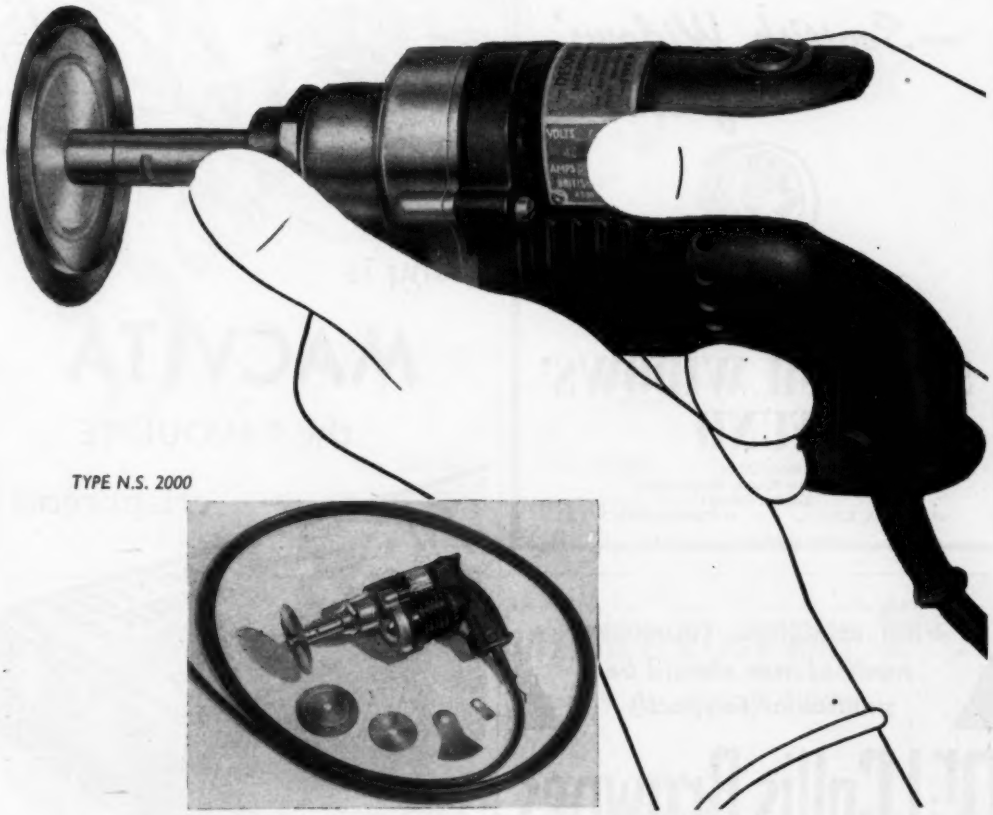
UNITED GLASS BOTTLE MANUFACTURERS LTD

8 LEICESTER STREET, W.C.2

Telephone: Gerrard 8611 (18 lines) *Telegrams:* Unglaboman, Lesquare, London

Cuts Bone...

but the blade does not rotate



TYPE N.S. 2000

THE DESOUTTER electric necropsy saw has been designed with a blade which does not rotate but has a high speed oscillating movement of only a few degrees. It will cut hard materials only. For instance, a section of a skull cap may be removed with the minimum damage to the soft brain tissue underneath. The necropsy saw is normally supplied with a set of saws and an eccentric guard: this acts as a variable depth stop and gives easy control of penetration. Descriptive literature will gladly be sent on request.

Desoutter NECROPSY SAW

Desoutter Bros., Ltd., The Hyde, Hendon, London, N.W.9. Telephone: Colindale 6346 (5 lines). Telegrams: Despnuco, Hyde, London
CRC16M

for sterling quality —Scottish Widows' of course.

THE HALL MARK OF STERLING QUALITY IN MUTUAL LIFE ASSURANCE

SCOTTISH WIDOWS' FUND

Head Office:
9 St. Andrew Square, Edinburgh, 2
London Offices:
28, Cornhill, E.C.3 17 Waterloo Place, S.W.1

WHEN PRESCRIBING CHLORODYNE
medical men should be particular to specify

Dr. J. Collis Browne's CHLORODYNE

The Original and only genuine Chlorodyne

used with unvarying success by the Medical Profession in all parts of the world for over 100 YEARS

Always insist on "Dr. Collis Browne's"

THERE IS NO SUBSTITUTE

Ah, Macvita!

Why is

MACVITA

the FAVOURITE crispbread?

Because it is

SO palatable

By Appointment to H.M. the Queen Biscuit Manufacturers.

If you would like us to send you a sample packet of MACVITA, free of charge, please send us your name and address. (Block letters please.)

THIS IS THE ANALYSIS

Carbohydrates, Starch	57·4%	
Saccharides	5·8%	63·2%
Fat		20·5%
Protein		9·1%
Ash		2·3%
Fibre		1·6%
Moisture		3·3%

Calorific Value per 100 grms: 470

McVITIE & PRICE LTD • EDINBURGH • LONDON • MANCHESTER

Boldolaxine

"The Laxative known all over the world"

Formula :

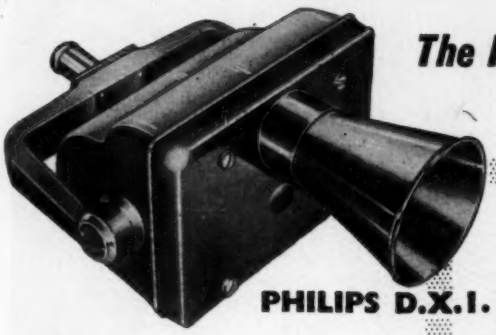
Quantity of Active ingredient in each Tablet

BOLDO	0.07	PODOPHYLLIN	0.002
EXT. BELLAD. SICC. B.P.	0.003	ICELAND MOSS	0.01
PHENOLPHTHALEIN ...	0.075		

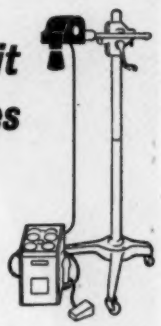
Sole Distributors in Great Britain

W. FLETCHER (CHEMISTS) LTD.

5 RAMPAYNE STREET, LONDON, S.W.1 Telephone: VICtoria 5555

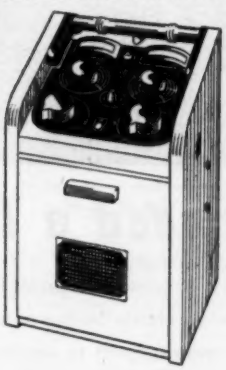


The PORTABLE X-ray unit with so many uses



The D.X.1 assembled for use

PHILIPS D.X.1.



The D.X.1 portable X-ray unit with its phenomenally high output—85 kV, 15 mA—has a very much wider sphere of application than is usually associated with equipment of its kind.

The control is designed to permit accurate reproduction of the radiographic results even with fluctuating supply mains. The fluoroscopic rating is more than adequate.

You will want to know more of this equipment — which is procurable throughout the world.

The D.X.1 packed for transportation

The D.X.1. is on show at the X-ray Centre, Century House

Write or 'phone for further information

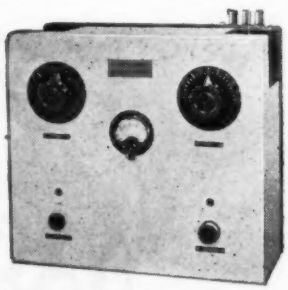
PHILIPS ELECTRICAL LTD

X-RAY DIVISION

CENTURY HOUSE · SHAFTESBURY AVENUE · LONDON · WC2 · GERrard 7777

(PXM0111)

Reliability in delicate Surgery



The THERATOR MINOR

DIATHERMY, Type MME3

For the most delicate electro-surgery, the Therator Minor Diathermy reliably provides two distinct cutting-currents, ideal respectively, for ophthalmic and neuro-surgery. Output is valve-generated, perfect coagulation being assured by careful selection of component values. Current intensity is regulated by a single knob and is repeatable at pre-selected control positions. A *de luxe* set of electrodes and mobile trolley complete the equipment if required. Further information is freely available.

MARCONI INSTRUMENTS

SPECIALISTS IN:

DIATHERMY · AUDIOMETRY · ELECTRO-ENCEPHALOGRAPHY · THERAPEUTIC AND DIAGNOSTIC X-RAYS

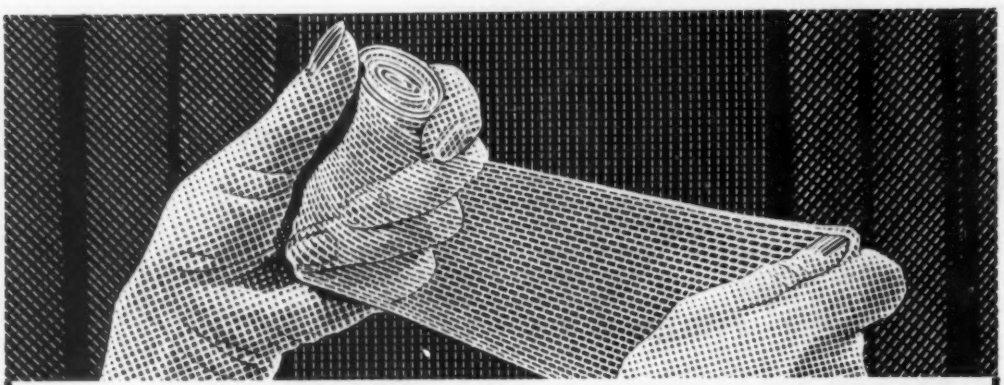
MARCONI INSTRUMENTS LTD · ST. ALBANS · HERTS · Phone: ST. ALBANS 6160/9

30 Albion Street, Kingston-upon-Hull. Phone: Hull Central 16144. 19 The Parade, Leamington Spa. Phone: 1408

And at: BELFAST · CARDIFF · GLASGOW · LIVERPOOL · NEWCASTLE · SOUTHAMPTON

Managing Agents in Export: MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED · MARCONI HOUSE · STRAND · LONDON, W.C.2

EM 2



"You will need a Lastonet bandage"

The Lastonet bandage may be prescribed under the National Health Scheme. Its elastic net has a two-way stretch to give firm, even support to sprained or weak joints. At the same time the net allows a healthy degree of ventilation. In 5-yard lengths (fully stretched) and 2½, 3, 3½, 4 or 6 inch widths.

Lastonet
ELASTIC BANDAGE

LASTONET PRODUCTS LTD CARN BREA REDRUTH CORNWALL

Φ5

JENNER INSTITUTE Glycerinated VACCINE LYMPH

PREPARED IN ACCORDANCE WITH THE THERAPEUTIC SUBSTANCES REGULATIONS (BRITISH PRODUCT)

Telephone: BATTERSEA 1347

SINGLE VACCINATION TUBES - - - 12/- dozen. Postage extra
LARGE TUBES (EXPORT only) sufficient for 5 vaccinations, 20/- dozen

Telegrams: "JENVACTER, SOUPHONE, LONDON" (2 words)

JENNER INSTITUTE FOR CALF LYMPH LTD., 73, Battersea Church Road, S.W.11

Second-hand Books

ON

MEDICINE, SURGERY AND ALLIED SUBJECTS

STANDARD WORKS : SETS OF MEDICAL JOURNALS, OLD AND RARE MEDICAL BOOKS

LARGE OR SMALL COLLECTIONS BOUGHT

H. K. LEWIS & Co. Ltd.

LONDON: 136, GOWER STREET, W.C.1

Telephone: EUSton 4282 (7 lines) P.O. Box 66

RHEUMATISM

AND KINDRED AILMENTS

Harrogate, the largest Spa in Great Britain, is actively engaged in providing all types of physical treatment in connection with the rheumatic disease and all types of physical rehabilitation. Extensive alterations have taken place, including the equipment of the establishment with DEEP POOL THERAPY, medical gymnastic facilities and occupational therapy.

HARROGATE SPA

Treats both private patients under its All-inclusive Treatment Scheme, and National Health patients.

Medical enquiries as to cost, and how treatment can be obtained, will be welcomed by—

B. Roberts, Manager,
Section 2,

THE ROYAL BATHS
HARROGATE

THE LANCET

Annual Subscription: £3 3s 0d per annum

Special reduced rates to Medical Students and Doctors within 1 year of qualification.
Air-mail edition available

CHISWICK HOUSE

PINNER, MIDDLESEX

Telephone: PINNER 234

A Private Home for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.

A modern house, 12 miles from Marble Arch, in attractive secluded grounds. Patients treated under Certificate, Temporary or Voluntary status. Modern forms of treatment, including psychotherapy, narco-analysis, modified insulin, occupational therapy, E.C.T., etc.

DOUGLAS MACAULAY, M.D., D.P.M.

HEIGHAM HALL, NORWICH

PRIVATE MENTAL HOME for Nervous and Mental illness. All types of treatment carried out. Accommodation for Alcoholics and Addicts available. Special Geriatric Unit now open. Fees from 6 gns. per week upwards according to requirements.

Apply to Dr. J. A. SMALL Telephone: Norwich 20080

PARK SANATORIUM

(FORMERLY SANATORIUM TURBAN)

DAVOS-PLATZ, SWITZERLAND

First-class house, 5,150 feet above sea-level. Large park and wood belonging to the Sanatorium. Terms for board and residence, including room, medical treatment, etc., from Fcs. 18 per day. Prospectus.

Medical Superintendent, F. CHARLES, M.D.

CLIFFDEN, TEIGNMOUTH

For the early treatment of nervous disorders and patients needing rest and care

A well-appointed House with spacious balconies and extensive views of the South Devon Coast. Beautiful garden and own dairy in 35 acres in the same grounds. ROWDENS, a comfortable house with lovely views. Private road to the beach

There is also a charming house, EBWORTHY, MANATON, DARTMOOR, situated in 25 acres, 1100 ft. up for bracing moorland air

Resident Physicians—BERTHA M. MULES, M.D., B.S. ANNE S. MULES, M.R.C.S., L.R.C.P *Telephones*—TEIGNMOUTH 289 and 537

ST. ANDREW'S HOSPITAL FOR NERVOUS AND MENTAL DISORDERS
NORTHAMPTON

PRESIDENT: THE EARL SPENCER

MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., F.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, biochemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods; insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombières treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-ray Room, an Ultraviolet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for biochemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: Northampton 4354 (3 lines)), who can be seen in London by appointment.

CHEADLE ROYAL, CHEADLE, CHESHIRE
REGISTERED MENTAL HOSPITAL

PRESIDENT: THE RIGHT HON. THE EARL OF DERBY, M.C.

MEDICAL SUPERINTENDENT: W. V. WADSWORTH B.Sc., M.B., M.R.C.P., D.P.M.

This Hospital receives all types of patients who are suffering from psychological and senile illnesses. It has recently been extensively re-decorated and central heating has been installed throughout, making it one of the most luxuriously appointed hospitals in the country. Private rooms, with special nurses, can be provided. All patients receive very careful and thorough clinical and pathological investigations; the most modern psychiatric treatment is available, including deep insulin therapy. Psychotherapeutic treatment is employed in suitable cases.

Occupational therapy is a special feature of the Hospital and there are excellent facilities for indoor and outdoor recreation—tennis, cricket, croquet, badminton, billiards, cinema, television, etc. Geriatric units for mild cases of senility are provided where patients can pursue as normal a life as possible.

The Hospital is situated in three hundred acres of pleasant Cheshire parkland and yet is only nine miles from Manchester. Glan-y-Don is the Hospital's convalescent home, overlooking the sea at Colwyn Bay. It is extremely comfortable and well appointed and has its own farm and market garden.

For terms and further particulars, apply to the Medical Superintendent. Telephone: GATLEY 2231.

THE MEDICAL PROTECTION SOCIETY LIMITED

Over 60 years experience in medical defence and protection

Complete indemnity granted to members in cases undertaken on their behalf

ANNUAL SUBSCRIPTION: £1 for first three years for newly qualified entrants and £2 thereafter

Full particulars from the Secretary (Dr. Alistair French), Victory House, Leicester Sq., W.C.2. Gerrard 4553 and 4814

Vacancies

ACADEMIC AND EDUCATIONAL SECTION — Page 40

ADMINISTRATIVE SECTION
Scotland. South-Eastern R.H.B. Med. Supt. 43

ANÆSTHETICS
Hackney Group H.M.C. Sr. H.O. .. 43
Royal Northern, N.7. Sr. H.O. .. 44
South East Met. R.H.B. Reg. .. 44
St. James', S.W.12. Sr. H.O. .. 45
Aylesbury. Royal Bucks & Assoc. H.M.C. Sr. H.O. 45
Birmingham Accident. Locum Sr. H.O. 46
Birmingham. Dudley Road. Sr. H.O. 46
Birmingham R.H.B. Cons. 42
Birmingham R.H.B. Reg. 46
Doncaster Royal Infy. Sr. H.O. .. 47
Leeds A Group H.M.C. Sr. H.O. .. 48
Leeds R.H.B. Reg. & Locum Regs. 48/49
Leeds R.H.B. Sr. H.M.O. 42
Leeds R.H.B. Sr. Regs. 48
Luton & Dunstable. Reg. 48
Scotland. Eastern R.H.B. Reg. .. 51
Southend-on-Sea Gen. Sr. H.O. .. 51
Stoke-on-Trent. City Gen. Sr. H.O. 51
Stoke-on-Trent. City Gen. Sr. Reg. 51
Swansea. Sr. H.O. 51
Winchester. Royal Hants County. H.O. 52
Wolverhampton Group. Sr. H.O.'s.. 52
Canada. Catherine Booth Maternity. Anæsthesiologist 53

BACTERIOLOGY
Scotland. Western R.H.B. Reg. .. 51

BIOCHEMISTRY
University College, W.C.1. Sr. H.M.O. 42

CARDIOLOGY
Hospa. for Diseases of the Chest. P.-t. Cons. 42
Bournemouth & East Dorset H.M.C. Reg. 46

CASUALTY
Charing Cross. Jr. H.M.O. 43
Connaught, E.17. Sr. H.O. 43
Hackney, E.9. Sr. H.O. 43
Mile End, E.1. Sr. H.O. 44
North Middlesex, N.18. Sr. H.O. .. 44
Paddington Green Children's, W.2. H.O. 44
St. Charles', W.10. Sr. H.O. 45
Wanstead, E.11. Sr. H.O. 45
Bristol United Hosps. Sr. H.O. .. 46
Canterbury. Kent & Canterbury. Sr. H.O. 46
Chesterfield Royal. Sr. H.O. 47
Edgware Gen. Sr. H.O. 47
Hastings. Royal East Sussex. Sr. H.O. 48
Hull. Victoria Hosp. for Sick Child. Locum Sr. H.O. 47
Leeds Public Dispensary & Hosp. Sr. H.O. 48
Liverpool. Broadgreen. Sr. H.O. or H.O. 48
Llanelly. Carms. Sr. H.O. 49
Maidenhead. H.O. 49
Maidstone. West Kent Gen. Sr. H.O. 49
Newcastle R.H.B. Sr. Cas.O. .. 42

Nottingham Children's. H.O. .. 50
Nottingham Gen. Sr. H.O. 50
Poole Gen. Sr. H.O. 50
Rhyl. Royal Alexandra. Sr. H.O. .. 51
Slough. Upton. H.O. 51
Southend-on-Sea Gen. Reg. (Temp.) 51
Southend-on-Sea Gen. Sr. H.O. .. 51
Stockport Infy. Sr. H.O. 51
Swansea. Locum Jr. H.M.O. 52
Swindon Hosp. Group. Sr. H.O. .. 52
Winchester. Royal Hants County. Sr. H.O. 52

CHEST AND TUBERCULOSIS
Brompton. S.W.3. H.O.'s 43
North Middlesex Hosp. & Edmonton Chest Clinic, N.18. Sr. H.O. .. 44
Chester. Barrowmore. Sr. H.O. .. 47
Driffield. Northfield San. Sr. H.O. .. 47
Henley-on-Thames. Peppard Chest. Jr. H.M.O. 48
Leeds R.H.B. Sr. H.M.O. 42
Manchester R.H.B. Sr. H.M.O. .. 42
North East Met. R.H.B. Reg. .. 44

DERMATOLOGY
Isleworth. West Middlesex. Sr. H.O. 48
Birmingham R.H.B. P.-t. Cons. .. 42
Nottingham City Hosp. & Skin Clinic. Reg. 50

EAR, NOSE, AND THROAT
Ashford, Middx. H.O. 45
Birmingham & Midland E. & T. H.O. 46
Farnborough, Kent. Sr. H.O. .. 47
Hull A Group H.M.C. Sr. H.O. .. 47
Maidstone. Kent County Ophthalmic & Aural. Sr. H.O. 49
Newport. Royal Gwent. Jr. H.M.O. 50
Salisbury Gen. Sr. H.O. 51
Southampton. Royal South Hants. & Southampton Gen. Sr. H.O. .. 51
Taunton & Somerset. H.O. 52

GENITO-URINARY
Leeds United Hosps. & R.H.B. Reg. 49

GERIATRICS
Isleworth. West Middx. H.O. .. 48
Leeds R.H.B. Sr. H.M.O. 42
Manchester R.H.B. Cons. 42
North West Met. R.H.B. Sr. H.M.O. 42

INFECTIOUS DISEASES
Paisley I.D. Jr. H.M.O. 50

LARYNGOLOGY AND OTOLOGY
Leeds R.H.B. Reg. 49

MEDICINE
Elizabeth Garrett Anderson, N.W.1. H.O. 43
Hôpital et Dispensaire Français, W.C.2. Hon. Phys. 44
Lambeth, S.E.11. H.O. 44
Middlesex, W.1. P.-t. Cons. 42
New End, N.W.3. Reg. 44
Royal Masonic, W.6. Reg. 44
South London Hosp. for Women & Children, S.W.4. P.-t. Reg. .. 45
St. George-in-the-East, E.1. H.O. .. 45
St. Giles, S.E.5. Sr. H.O. 45
St. Thomas's & South West Met. R.H.B. Sr. Reg. 45
Whipps Cross, E.11. H.O. 45
Ashford, Middx. H.O. 45
Aylesbury. Stoke Mandeville. H.O. 45
Barrow-in-Furness. North Lonsdale. Sr. H.O. 45
Birmingham United Hosps. Reg. .. 46
Blackburn & Dist. H.M.C. Sr. H.O. .. 46
Bolton & Dist. H.M.C. Sr. H.O. .. 46
Bournemouth. Royal Victoria. H.O. 46
Cardiff United Hosps & Welsh R.H.B. Sr. Reg. 46
Chepstow. Mount Pleasant. Jr. H.M.O. 47
Chester-le-Street. Gen. Sr. H.O. .. 47
Douglas. Noble's Isle of Man. H.O. .. 47
East Anglian R.H.B. Reg. 47
Exeter. Royal Devon & Exeter. H.O.'s 47
Huddersfield Royal Infy. H.O. .. 48
Ipswich. St. Helens. H.O. 48
Leeds R.H.B. Reg. & Locum Regs. 48/49
Manchester. Crumpsall. Reg. .. 49
Manchester R.H.B. Reg. 49
Manchester Victoria Mem. Jewish. Sr. H.O. 49
Mitcham Junction. Wandle Valley. Sr. H.O. 49
Newmarket Gen. H.O. 50
North East Met. R.H.B. Regs. .. 44
Oxford R.H.B. Sr. Reg. 50
Portsmouth Group H.M.C. H.O. .. 50
Ruthin Castle, N. Wales. Asst. Phys. 42
Stoke-on-Trent. City Gen. H.O. .. 51
Taplow. Canadian Red Cross Mem. H.O. 52
Torquay. Torbay. Sr. H.O. 52
West Bromwich & Dist. Gen. Pre-reg. H.O. 52
Dublin. National Children's. Reg. .. 52

NEUROLOGY
National Hosps. for Nervous Diseases, W.9. Sr. H.O. or Reg. 44

NEUROSURGERY
Birmingham R.H.B. Reg. 46
Manchester. Crumpsall. Reg. .. 49

OBSTETRICS AND GYNÆCOLOGY
Lambeth, S.E.11. H.O. 44
Mothers' (Salvation Army), E.5. Sr. H.O. 44
North East Met. R.H.B. Reg. .. 44
North Middlesex, N.18. Sr. Reg. (Temp.) 44
Royal Northern, N.7. Sr. H.O. .. 44
St. George's, S.W.1. Reg. (Temp.) .. 45
St. Mary Abbots, W.8. Reg. .. 45
Birmingham. Marston Green Maternity. H.O. 46
Birmingham United Hosps. H.O. .. 46
Derby. Derbyshire Hosp. for Women. Pre-reg. H.O. or Sr. H.O. 47
Llanelly. Carms. Sr. H.O. 49
Nottingham City. Sr. H.O. or H.O. .. 50
Reading. Royal Berkshire. H.O. .. 51
Salisbury Gen. H.O. 51
Scotland. Western R.H.B. P.-t. Cons. 43
Taplow. Canadian Red Cross Mem. H.O. 52
Woking & Chertsey Group H.M.C. Locum Sr. Reg. 52
York A & Tadcaster H.M.C. Sr. H.O. 52

OPHTHALMOLOGY
Leeds R.H.B. Sr. Reg. 48
Portsmouth Group H.M.C. Reg. .. 50
York A & Tadcaster H.M.C. Sr. H.O. 52
Jerusalem. Ophthalmic Hosp. of St. John. Warden. 43

ORTHOPÆDICS
Royal National Orthopædic, W.1. Sr. H.O.'s 44
Whipps Cross, E.11. H.O. 45
Alton. Lord Mayor Treloar Orthopædic. Reg. 45
Barnsley. Beckett. Reg. 45
Beverley. Westwood. H.O. 46
Blackburn & Dist. H.M.C. Jr. H.M.O. 46
Bolton & Dist. H.M.C. Sr. H.O. .. 46
Bridge of Earn. Perthshire. H.O. or Sr. H.O. 46
Doncaster Royal Infy. Sr. Reg. (Transitional) 47
East Anglian R.H.B. Reg. 47
Glasgow Royal Infy. Sr. H.O. .. 47
Inverness. Raigmore. H.O. 48
Ipswich & East Suffolk. H.O. .. 48
Isleworth. West Middlesex. Pre-reg. H.O. 48
Leeds R.H.B. Locum Regs. 48
Leeds R.H.B. Sr. H.M.O. 42
Newcastle R.H.B. Reg. 50
Norwich. Norfolk & Norwich. Locum Reg. 50
Nottingham Gen. Sr. H.O. 50
Portsmouth Group H.M.C. H.O. .. 50
Romford. Oldchurch. H.O. 50
Scunthorpe & District War Mem. Reg. 51
Southampton. Royal South Hants. Sr. H.O. 51
Southport. Promenade. Sr. H.O. .. 51
South West Met. R.H.B. Reg. .. 52
Swansea. Sr. H.O. 52
Welsh R.H.B. Reg. 52
Winchester. Royal Hants County. Sr. H.O. 53
Wolverhampton Group. Sr. H.O. or H.O. 53

PÆDIATRICS
Hosp. for Sick Child., W.C.1. Sr. H.O. 45
North East Met. R.H.B. Reg. .. 44
St. Thomas's, S.E.1. Reg. 45
Inverness. Raigmore. H.O. 48

PATHOLOGY
South London Hosp. for Women & Children, S.W.4. Reg. 44
Birmingham. Selly Oak. Sr. H.O. .. 46
Leeds R.H.B. Sr. Regs. 48
Reading Area. Sr. H.O. 51

PLASTIC SURGERY
Chepstow. Plastic Surgery, Jaw Injuries & Burns Centre. Sr. H.O. 46
Nottingham. Plastic Surgery, Jaw Injuries & Burns Centre. Sr. H.O. 50

PSYCHIATRY
Guy's Hosp. York Clinic, S.E.1. Sr. H.O. & Locum Sr. H.O. 43
Hosp. for Sick Child., W.C.1. P.-t. Reg. 45
North West Met. R.H.B. P.-t. Reg. 44
South East Met. R.H.B. P.-t. Regional Psych. 42
St. Thomas's, S.E.1. Reg. 45
Cambridge. Fulbourn. Sr. H.O. .. 46
Chesterfield H.M.C. Jr. H.M.O. .. 47
Cupar, Fife. Stratheden. H.O.'s .. 47
Leeds R.H.B. Sr. Regs. 48
Leeds R.H.B. Regs. & Locum Regs. 48/49
Leeds. St. James's. Sr. H.O. .. 49
Manchester. Crumpsall. Sr. H.O. .. 49
Montrose. Royal Mental. Jr. H.M.O. 49
Newcastle R.H.B. Reg. 50
North East Met. R.H.B. Regs. .. 44
Oxford R.H.B. Cons. 43
Oxford. Warneford & Park H.M.C. Sr. H.O. 50
Portsmouth. St. James. Sr. Reg. .. 50
Scotland. North-Eastern R.H.B. Cons. 43
Scotland. Western R.H.B. Sr. H.M.O. 43
Sheffield R.H.B. Sr. Reg. 51

RADIOLOGY
Royal Free, W.C.1. Reg. 44
Carshalton. St. Helier. Reg. .. 46
Leeds R.H.B. P.-t. Locum Cons. .. 42
Liverpool United Hosps. Reg. .. 48
Canada. Regina Gen., Sask. Director 43
Canada. Victoria Hosp. Diagnostic Radiologist 43

RADIOTHERAPY
Newcastle R.H.B. Cons. 42
Oxford R.H.B. Sr. H.M.O. 43
Oxford United Hosps. Sr. H.O. .. 50

SURGERY
Brompton, S.W.3. Sr. H.O.'s or Regs. 43
Central Middx., N.W.10. H.O. .. 43
Elizabeth Garrett Anderson, N.W.1. H.O. 43
Hammersmith Hosp. & P.G. Med. School. H.O. 43
Hospital of St. John & St. Elizabeth, N.W.8. H.O. 43
London Chest, E.2. Sr. H.O. or Reg. 44
London, E.1. P.-t. Cons. 42
St. Mary's, W.2. P.-t. Sr. H.O. .. 45
Wanstead, E.11. H.O. 45
Barry Accident & Surgical. Sr. H.O. 45
Beverley. Westwood. H.O. 46
Bexhill, Sussex. H.O. 46
Birmingham Accident. Locum Reg. 46
Blackburn & Dist. H.M.C. H.O.'s .. 46
Canterbury. Kent & Canterbury. H.O. 46
Chelmsford & Essex. Pre-reg. H.O. .. 47
Chertsey. St. Peter's. Sr. H.O. or Pre-reg. H.O. 47
Chichester. Royal West Sussex. Locum Reg. 47
Colchester Group H.M.C. H.O. .. 47
Ebbw Vale Gen. Jr. H.M.O. & Sr. H.O. 47
Enfield. Chase Farm. H.O. 47
Hereford County. H.O. 47
Hitchin. Lister. H.O. 48
Hitchin. North Herts. H.O. .. 48
Kidderminster & Dist. Gen. H.O. 48
Leeds. Chapel Allerton. Reg. .. 49
Leeds R.H.B. Regs. & Locum Regs. 48/49
Liverpool. Mossley Hill. Jr. H.M.O. 48
Llanelly. Carms. Jr. H.M.O. .. 49
Manchester. Royal Manchester Children's. Reg. 49
Newport, I.W. St. Mary's. H.O. .. 50
North East Met. R.H.B. Reg. .. 44
North West Met. R.H.B. Cons. .. 42
Nottingham Gen. Pre-reg. H.O. .. 49
Portsmouth Group. H.M.C. Sr. H.O. 50
Ramsgate Gen. Sr. H.O. 50
Reading. Battle. H.O. 51
Redhill County. Pre-reg. H.O. .. 50
Romford. Rush Green. Sr. H.O. .. 50
Romford. Victoria. Reg. (Temp.) .. 50
Stockport. Stepping Hill. Sr. H.O. .. 51
Stoke-on-Trent. City Gen. H.O. .. 51
Swansea. H.O. 52
Wolverhampton Group. H.O. .. 52
Northern Ireland Hosps. Auth. Reg. 52

THORACIC SURGERY
North Middlesex, N.18. H.O. .. 44
South East Regional Thoracic Surgery Unit, S.E.18. Sr. H.O. .. 44
St. Charles', W.10. Reg. 45
Cottingham. Castle Hill. Jr. H.M.O. 47
Leeds United Hosps. & R.H.B. Regs. 49
Ventnor, I.W. Royal National Hosp. for Diseases of the Chest. Jr. H.M.O. or Sr. H.O. 52
Wakefield. Pinderfields Gen. Jr. H.M.O. 52

PUBLIC APPOINTMENTS 52

NON-MEDICAL 53

MISCELLANEOUS 54

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

THE ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE

THE CERTIFICATE AND THE DIPLOMA IN PUBLIC HEALTH, AND THE DIPLOMA IN INDUSTRIAL HEALTH

The next bi-annual Course of Instruction for the Certificate in Public Health (C.P.H.) will commence on 30TH SEPTEMBER, 1955. This leads to Courses both for the Diploma in Public Health and for the Diploma in Industrial Health. All Courses may be taken either whole-time or part-time.

Prospectuses, enrolment forms, and full details may be obtained from the Secretary, 28, Portland-place, London, W.1 (Telephone : LANgham 2731/2 (7546)).

EDINBURGH POST-GRADUATE BOARD FOR MEDICINE

GENERAL SURGERY

A 3 months course of post-graduate surgery suitable for surgeons requiring a refresher course in the current outlook on general surgery or for graduates preparing to specialise in surgery, starts on 19TH MARCH and 8TH OCTOBER, 1956. The programme has been reorganised so as to provide coördinated clinical and systematic instruction in general surgery wards and specialised surgical units in Edinburgh. Fee £31 10s.

MEDICAL SCIENCES

A 3 months course in Applied Anatomy, Physiology, Pathology, Bacteriology and Biochemistry will begin on 25TH JUNE, 1956. This course is suitable for post-graduates wishing to take the Primary Fellowship Examination, as a final preparation in these subjects. Considerable basic knowledge is highly desirable prior to taking this course. Fee £31 10s.

2 courses in the Basic Sciences (Anatomy, Physiology, Pathology, including Bacteriology) will be conducted by the Fellows of the Royal College of Surgeons, and others, under the ægis of the Edinburgh Post-Graduate Board for Medicine. These courses, comprising lectures and demonstrations, will begin on 13th FEBRUARY and 15TH OCTOBER, 1956, and continue for 10 weeks. Fee £26 5s.

INTERNAL MEDICINE

Courses lasting 12 weeks, suitable for graduates wishing a refresher course, or to specialise in medicine, begin on 26TH MARCH and 24TH SEPTEMBER, 1956. These courses consist of 320 hours instruction, comprising lectures, clinical demonstrations and ward visits. Fee £31 10s.

Additional instruction in clinical pædiatrics is arranged in conjunction with the course in medicine, for which there is a small fee ; the numbers are limited.

Applications for enrolment should be addressed to the Director of Post-Graduate Studies, Surgeons' Hall, Edinburgh, 8, supplying particulars of qualifications and post-graduate experience.

THE UNIVERSITY OF GLASGOW and the ROYAL FACULTY OF PHYSICIANS AND SURGEONS

POSTGRADUATE MEDICAL EDUCATION COMMITTEE

A SHORT INTENSIVE POSTGRADUATE COURSE IN UROLOGY will be held on FRIDAY 18TH, SATURDAY 19TH, and SUNDAY 20TH NOVEMBER, 1955.

Friday, 18th November, 1955

9.15 A.M.	Short Operating Session and Clinico-pathological Demonstration at the Urological Department, Glasgow Royal Infirmary	Mr. ARTHUR JACOBS and Staff
2.30 P.M.	Short Operating Session Grading of Bladder Tumours Demonstration of Model for teaching Punch Prostatectomy Clinical Cases. At the Urological Department, Victoria Infirmary, Glasgow	Mr. T. L. CHAPMAN and Staff

Saturday, 19th November, 1955

9.15 A.M.	Short Operating Session Cystoscopic Demonstration of Bladder Tumours treated by Interstitial Irradiation Clinical Cases. At the Urological Department, Western Infirmary, Glasgow	Mr. W. S. MACK and Staff
	LECTURES	
2.15 P.M.	Renal Tuberculosis : Chemotherapy .. Surgery ..	Mr. W. M. BORTHWICK Mr. ARTHUR JACOBS
3.15 P.M.	Pædiatric Urology ..	Mr. A. IAN L. MAITLAND
4.30 P.M.	Renal Angiography	Mr. W. B. STIRLING

Sunday, 20th November, 1955

10 A.M.	Urological Forum— Bilateral Renal Calculi	
11.15 A.M.	Renal Function (Homer-Smith's Method)	Dr. J. E. CRAIK

The fee for admission to the Course is 3 guineas.

Those wishing to attend should make early application to the Registrar, Royal Faculty of Physicians and Surgeons, 242, St. Vincent-street, Glasgow, C.2, from whom a form of application may be obtained.

The Course will be limited to 24 practitioners and places will be alloted in order of return of application forms.

THE UNIVERSITY OF GLASGOW AND THE ROYAL FACULTY OF PHYSICIANS AND SURGEONS

POSTGRADUATE MEDICAL EDUCATION COMMITTEE

A course of Postgraduate Lectures will be given in the Hall of the Royal Faculty of Physicians and Surgeons, 242, St. Vincent-street, Glasgow, during the ensuing winter session on Wednesday evenings at 5 P.M.

The lectures will be on the general theme " Recent Advances in Medicine and Surgery " and will be suitable for members of hospital medical staffs and general practitioners.

The fee for admission to the course is 3 guineas.

Forms of application for admission to the course and further information may be obtained from the Registrar, Royal Faculty of Physicians and Surgeons, 242, St. Vincent-street, Glasgow C2.

Date	*Lecturer*	*Title*
1955		
5th Oct.	Prof. STANLEY GRAHAM	Changing Pædiatrics
12th Oct.	Mr. WALLACE M. DENNISON	Advances in Surgery of Infancy and Childhood
26th Oct.	Dr. R. L. RICHARDS	Peripheral Vascular Disease : The Arteries
2nd Nov.	Mr. R. B. WRIGHT	Peripheral Vascular Disease : The Veins
16th Nov.	Prof. J. N. DAVIDSON	Biochemical Approach to Cell Structure in Health and Disease
23rd Nov.	Mr. A. W. KAY	Modern Trends in Peptic Ulcer Therapy
30th Nov.	Dr. P. R. PEACOCK	Possible Ætiological Factors in Lung Cancer
14th Dec.	Mr. ROLAND BARNES	Modern Trends in Bone and Joint Tuberculosis
1956		
11th Jan.	Prof. T. SYMINGTON	Some Endocrine Aspects in relation to Modern Surgery
18th Jan.	Dr. ALEXANDER BROWN	Hæmolytic Anæmias
25th Jan.	Prof. D. F. CAPPELL	The Kidney in Hypertension
8th Feb.	Dr. H. R. MACLENNAN	Present-day Trends in Gynæcology in Britain and in the United States
15th Feb.	Dr. A. L. GOODALL	Hormones and Carcinoma of the Breast
22nd Feb.	Dr. W. F. M. FULTON	The Coronary Circulation in Health and Disease
7th March	Dr. JOHN MARSHALL	The Ophthalmic Problems of an Ageing Population
14th March	Mr. T. O. HOWIE	Present-day Treatment of Carcinoma of the Larynx
28th March	Prof. T. F. RODGER	Changing Concepts in Psychiatry

Library facilities will be available to those registered for the course.

THE UNIVERSITY
and the
ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW
POSTGRADUATE MEDICAL EDUCATION COMMITTEE

PRIMARY EXAMINATION FOR THE SURGICAL FELLOWSHIPS

A COURSE OF INSTRUCTION in Anatomy, Physiology, Biochemistry, Pathology and Bacteriology suitable for candidates preparing for the Primary examination of the Fellowship *qua* Surgeon of the Royal Faculty of Physicians and Surgeons of Glasgow will be held from 10TH OCTOBER to 2ND DECEMBER, 1955. (The Primary examination conducted by the Glasgow Royal Faculty is accepted by the Royal Colleges of Surgeons of Edinburgh, of England, and in Ireland in lieu of the corresponding examinations of these Bodies.) The Course will comprise a total of approximately 160 hours instruction given daily from MONDAYS to FRIDAYS, between the hours of NOON and 5.30 P.M. The course will be open to junior staff of hospitals in the Western Region of Scotland and also to other suitable applicants. Applicants not employed in the hospitals of the Western Region will, so far as can be arranged, be given an honorary clinical attachment to one of the surgical teaching units. The fee for the course is 25 guineas.

COURSE IN CHEMOTHERAPY FOR GENERAL PRACTITIONERS

A short intensive Course on the Principles and Application of Chemotherapy in Acute and Chronic Infectious Diseases will be held at Ruchill Hospital, Glasgow, from MONDAY, 3RD OCTOBER, to SATURDAY, 8TH OCTOBER, 1955. The course will comprise : (1) Systematic lectures followed by appropriate clinical demonstrations on the different infectious diseases, including pneumonia and tuberculosis. (2) Lectures and demonstrations on the scope and effective application of all forms of chemotherapy. (3) Practical demonstrations of the techniques used in the diagnosis and control of infectious disease. The fee for the Course is 5 guineas.

COURSE IN MENTAL DEFICIENCY

A short intensive postgraduate Course in Mental Deficiency will be held from 10TH OCTOBER to 28TH OCTOBER, 1955. The course will comprise : (*a*) Lectures and demonstrations in various aspects of mental handicap and mental deficiency ; (*b*) instruction in mental testing ; (*c*) visits to institutions. Fee : 15 guineas. The course will be limited to 20 practitioners, places being allocated in order of return of application forms.

Those wishing to attend any of these Courses should make early application to the Director of Postgraduate Medical Education, The University, Glasgow, W.2, from whom further details and a syllabus may be obtained

UNIVERSITY OF GLASGOW
SESSION 1955–56
DIPLOMA IN PUBLIC HEALTH

A COURSE OF INSTRUCTION covering 3 Academic Terms will commence in OCTOBER, 1955.

The fee for the full course is £36 4s. 6d.

Application forms may be obtained from the Dean of the Faculty of Medicine, The University, Glasgow, and should be lodged not later than 30th September.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY

MEDICAL POSTGRADUATE TRAINING FELLOWSHIPS

Applications are invited from Medical Graduates for a Fellowship which may be held in any subject in the medical curriculum.

These training Fellowships have been established with the general object of advancing the art and science of medicine by means of postgraduate study, training and research and with the particular object of enabling graduates in medicine to obtain experience and training in medical research.

These Fellowships, which may be held wholly or partly in Australia or abroad, may include Fellowships for primary research and of academic intent, Fellowships for vocational study and training and Fellowships for a combination of such purposes.

Appointment will be for 1 year, but may be renewed for a second or third year. The salary will be up to £1200 for a single man and £1500 for a married man, which will include fares and allowances.

Applications will close on 15th October, 1955, and should be made to the Honorary Director, Post-Graduate Committee in Medicine, 131, Macquarie-street, Sydney, New South Wales, Australia, to whom intending applicants must first communicate so that full particulars of the Fellowship and details of the method of application may be obtained.

GUY'S HOSPITAL MEDICAL SCHOOL, S.E.1. Applications are invited for the appointment of ASSISTANT to the Director of the Department of Obstetrics and Gynæcology (part-time). Salary range from £750 to £900 p.a. Duties to commence as soon as possible.

Forms of application are obtainable from, and should be lodged with, the Dean, Guy's Hospital, S.E.1, not later than the 14th September, 1955.

POSTGRADUATE MEDICAL SCHOOL OF LONDON, HAMMERSMITH HOSPITAL. LECTURER IN SURGERY. Applications are invited for a Whole-time Lecturer in the Department of Surgery. The duties will include assistance in the general work of the Department, including the teaching of postgraduate students, and in research. The successful candidate will act as Assistant Surgeon to the Professor of Surgery and will have full clinical facilities for the care of patients in the professorial wards. The appointment will carry Consultant rank (honorary and unpaid) in Hammersmith Hospital. Salary £1900–£2400, plus family allowances where applicable, with superannuation provision. The appointment will be for a period of 5 years.

Apply to the Dean, Postgraduate Medical School of London, Ducane-road, London, W.12, by 16th September.

MEDICAL RESEARCH FELLOWSHIP AT THE HEBREW UNIVERSITY
JERUSALEM, ISRAEL

Applications are invited for the award of the MAX AND REBECCA SCHRIRE MEDICAL RESEARCH FELLOWSHIP (£400) to a postgraduate student for research in Medicine, with particular stress on ophthalmology, to be carried out at the Hebrew University in Jerusalem.

Applications, containing biographical data, a brief outline of the proposed research project and details of previous work, if any, on the same or related subject, should be forwarded to the Office of the Dean, The Hebrew University-Hadassah Medical School, P.O.B. 1255, Jerusalem, Israel, not later than 1st October, 1955.

Any person requiring further information about the Hebrew University and the Medical School may apply to the Secretary, Friends of the Hebrew University, 237, Baker-street, London, N.W.1.

THE UNIVERSITY OF LEEDS. Department of Medicine. Applications are invited from medically qualified candidates for the post of RESEARCH ASSISTANT IN CLINICAL MEDICINE at a salary within the range £750–£850, according to qualifications and experience. The appointment will be made for 1 year in the first instance, renewable.

Applications (3 copies), stating date of birth, qualifications, and experience, together with the names of 3 referees, should reach the Registrar, The University, Leeds, 2 (from whom further particulars may be obtained), not later than 3rd October, 1955.

THE UNIVERSITY OF MANCHESTER. Applications are invited from registered medical practitioners for the post of LECTURER in the Department of Occupational Health. Candidates should have had good clinical experience and should be able to undertake research. Duties will include practical work in the field. The appointment will be made for a period extending to 30th September, 1957. Salary not less than £1500 p.a., with membership of the F.S.S.U. and children's allowance scheme.

Applications should be sent not later than 14th September, 1955, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained.

THE UNIVERSITY OF MANCHESTER. Applications are invited from candidates with medical qualifications registrable in this country for the post of LECTURER IN OPHTHALMOLOGY. The successful candidate will be expected to carry out research in the University Department of Ophthalmology at the Manchester Royal Eye Hospital and to assist in the clinical work of this unit. Salary on a scale rising to £2000 p.a., with membership of F.S.S.U. and children's allowance scheme : initial salary according to qualifications and experience.

Applications should be sent not later than 14th September, 1955, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained.

THE UNIVERSITY OF SHEFFIELD. Applications are invited for a post of LECTURER or ASSISTANT LECTURER IN BIOCHEMISTRY to begin duties on 1st January, 1956. Salary scales : (*a*) for candidates holding a registered medical qualification—Lecturer £800–£100–£1700, Assistant Lecturer £700–£50–£800 ; (*b*) for other candidates—Lecturer £650–£50–£1350, Assistant Lecturer £550–£50–£650. Commencing salary according to qualifications and experience, with F.S.S.U. provision and family allowance.

Further particulars should be obtained from the Registrar, to whom applications (4 copies) should be sent by 1st October, 1955.

UNIVERSITY OF ABERDEEN. Applications are invited for the post of LECTURER IN PATHOLOGY. Salary scale (*b*), £1100–£1500, or scale (*a*), £700–£1000, with placing according to qualifications. Superannuation (F.S.S.U.) and children's allowance. Part of removal expenses refunded.

Conditions of appointment and forms of application should be obtained from the undersigned, with whom applications (8 copies), giving the names of 3 referees, should be lodged not later than 21st September, 1955. Applicants outside the British Isles may submit 1 copy only.

The University, Aberdeen. W. S. ANGUS, Secretary.

UNIVERSITY OF HONG-KONG. Applications are invited for the post of LECTURER IN PHARMACOLOGY. Salaries are under immediate review. Present salary for a family man on expatriate terms (including a variable high cost-of-living allowance) is between £1575 and £1950 a year. The local equivalent of income-tax cannot exceed 12½% of gross income. The post has been newly established and is being advertised for the first time. Applicants should possess a medical qualification and have had some experience in teaching and research.

Further particulars and information as to the method of application may be obtained from the Secretary, Association of Universities of the British Commonwealth, 36, Gordon-square, London, W.C.1. The closing date for the receipt of applications in London is 15th September, 1955.

MAKERERE COLLEGE. The University College OF EAST AFRICA. Applications are invited from medically qualified candidates for the CHAIR OF PHYSIOLOGY. Salary £2200–£100–£2300 p.a., plus temporary cost-of-living allowance £162 p.a. F.S.S.U. Child allowance £50 p.a. per child (maximum £150 p.a.). Rent, according to quarters provided, £45–£85 p.a. (including basic furniture). Free passages for appointee and family (up to 4 adult passages) on appointment, termination, and leave (3 months every 2 years).

Applications (8 copies), giving full qualifications and experience, and naming 3 referees, to be sent as soon as possible to Secretary, Inter-University Council for Higher Education Overseas, 1, Gordon-square, London, W.C.1, from whom further particulars may be obtained.

MAKERERE COLLEGE. The University College of EAST AFRICA. Applications are invited for (1) SENIOR LECTURESHIP or (2) LECTURESHIP IN PHARMACOLOGY.

Salary scales: For medically qualified applicants: (1) £1600–£50–£1800 p.a.; (2) £1116–£42–£1158–£48–£1350–£54–£1566 p.a.

For non-medically qualified applicants: (1) £1450–£50–£1650 p.a.; (2) £960–£36–£1032–£42–£1158–£48–£1350–£54–£1404 p.a.

Cost-of-living allowance 10% of salary (maximum £162 p.a.). Child allowance £50 p.a. per child (maximum £150 p.a.). Free passages for member of staff and family (up to 4 adult passages) on appointment, termination, and leave (3 months every 2 years). Rent, according to quarters provided, £45–£85 p.a (including basic furniture).

Applications (6 copies), giving full qualifications and experience, and naming 3 referees, to be received as soon as possible by Secretary, Inter-University Council for Higher Education Overseas, 1, Gordon-square, London, W.C.1, from whom further particulars may be obtained.

Hospital Services: Senior Appointments

HOSPITALS FOR DISEASES OF THE CHEST. The Board of Governors invites applications for the appointment of ASSISTANT CARDIOLOGIST (Consultant) to the Hospitals for Diseases of the Chest. In the first instance, the appointment involves attendance, for 2 notional half-days weekly at the London Chest Hospital, and in due course, the successful candidate may be invited to undertake up to 3 additional notional half-days at Brompton Hospital. Further information may be obtained on request.

Applications (9 copies), stating date of birth, qualifications and experience, with the names of 3 referees, should reach the undersigned not later than 17th September, 1955.

KENNETH A. F. MILES, Secretary to the Board.

Brompton Hospital, S.W.3.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of Part-time CONSULTANT in General Surgery. Candidates must be Fellows of the Royal College of Surgeons. The successful candidate will be required to attend not less than 4 half-days weekly.

Applications (12 copies) giving full particulars, together with the names and addresses of 3 referees, should be sent to the undersigned (from whom further particulars may be obtained) to arrive by 30th September, 1955.

H. BRIERLEY, House Governor.

MIDDLESEX HOSPITAL, W.1. Applications invited for the post of ASSISTANT PHYSICIAN for diseases of the nervous system (Consultant) for 4 half-days weekly. Candidates must be Fellows or Members of the Royal College of Physicians of London.

Applications, naming 3 referees should be sent to the Deputy-Superintendent by 17th September.

RE-ADVERTISEMENT

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for the appointment, for 4–5 notional half-days, of REGIONAL PSYCHIATRIST who will act as Adviser to the Board under the general supervision of the Senior Administrative Medical Officer. These sessions do not include work of a clinical nature. Salary in accordance with nationally negotiated terms.

Applications, with the names of 3 referees, should be received by the Senior Administrative Medical Officer, 11, Portland-place, London, W.1, by 24th September, 1955.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. Applications are invited for the post of Whole-time BIOCHEMIST (graded Senior Hospital Medical Officer) in the Department of Clinical Pathology.

Applications (12 copies), with names of 3 referees, to Administrator and Secretary, by 24th September, 1955.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

Birmingham (Selly Oak) Group

SENIOR CONSULTANT ANÆSTHETIST. Whole-time in charge of anæsthetic services—Little Bromwich General Hospital (158 general beds increasing to 476; 214 for infectious diseases), centre for treatment of poliomyelitis cases. Experience respiratory problems of poliomyelitis an advantage.

Wolverhampton Group

Part-time CONSULTANT ANÆSTHETIST (1 notional half-day weekly). Duties at Royal Hospital, Wolverhampton.

Birmingham (Dudley Road) Group

Whole-time CONSULTANT ANÆSTHETIST. Duties at Dudley Road Hospital (6 notional half-days), Eye and E.N.T. Hospital (5 notional half-days). Experience specialty required and all posts D.A. (Parts I and II) or F.F.A.R.C.S. required.

Lichfield, Sutton Coldfield and Tamworth Group

Part-time CONSULTANT DERMATOLOGIST (3 notional half-days weekly). Duties at Lichfield, Victoria (1 notional half-day) Sutton Coldfield General (1 notional half-day), and Tamworth General (1 notional half-day) Hospitals. Wide experience specialty essential.

Applications (15 copies), stating name, age, nationality, qualifications, previous appointments, and details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, before 19th September, 1955.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT GERIATRICIAN (Senior Hospital Medical Officer scale) for duties at hospitals in the Hull and East Riding areas. The successful candidate will work under the Consultant Geriatrician and will be required to reside in Hull or within such distance thereof as may be approved by the Board. The duties will initially be in the Hull area but as the service develops will also include the East Riding area. Previous experience in physical medicine will be an advantage.

Applications (12 copies), stating age, qualifications and details of present and previous appointments with dates, together with the names of 3 referees, to the Secretary, Park-parade, Harrogate, not later than 23rd September, 1955.

LEEDS REGIONAL HOSPITAL BOARD. Part-time Locum CONSULTANT RADIOLOGIST (9 sessions) for duties at hospitals in the Bradford A Group. Appointment will be for a minimum period of 18 months.

Applications, stating age, qualifications, and experience, together with the names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, by 24th September, 1955.

LEEDS REGIONAL HOSPITAL BOARD.

Whole-time ASSISTANT ANÆSTHETIST (Senior Hospital Medical Officer scale), Wakefield A and B groups. The person appointed to be resident in or near Wakefield.

Whole-time ASSISTANT CHEST PHYSICIAN AND DEPUTY MEDICAL SUPERINTENDENT (Senior Hospital Medical Officer scale) at the Castle Hill Sanatorium, Cottingham, East Yorks. The person appointed must be resident and will have charge of beds under the Medical Superintendent and visiting Chest Consultants, and will also be required to attend occasionally at Raywell and Driffield Sanatoria and Chest Clinics in the Hull area. There is a Thoracic Surgical Unit of 51 Beds at the adjacent Castle Hill Hospital.

Whole-time ASSISTANT ORTHOPÆDIC SURGEON (Senior Hospital Medical Officer scale) to undertake duties mainly at the Royal Bath and White Hart Hospitals, with additional duties amounting to approximately a quarter of his time at the Harrogate General Hospital. The person appointed to be resident in or near Harrogate.

Applications (12 copies), stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Deputy Secretary, Park-parade, Harrogate, by 23rd September, 1955.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) Whole-time CONSULTANT PHYSICIAN (geriatrics) to the Ashton, Hyde and Glossop Hospital Centre, mainly at Ashton-under-Lyne General Hospital. Good experience in general medicine, special interest and experience in the treatment and rehabilitation of the chronic sick and higher qualifications essential. Appointee required to undertake the domiciliary investigation of patients and establish close liaison with general practitioners and local health authorities. 14th September, 1955.

(*b*) Whole-time TUBERCULOSIS PHYSICIAN (Senior Hospital Medical Officer), Preston and Chorley Hospitals (Preston and Chorley Chest Clinics, Preston Isolation Hospital, Heath Charnock Hospital and Chestnuts Sanatorium) to work under general guidance of a Consultant. Previous experience of thoracic medicine and tuberculosis essential, higher qualification desirable. The appointment may be made in conjunction with the Local Health Authorities concerned, for whom the appointee will carry out duties in connection with prevention, care and after-care. 12th September, 1955.

Application forms, from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by dates stated.

NEWCASTLE REGIONAL HOSPITAL BOARD. Regional CANCER SERVICE. CONSULTANT RADIOTHERAPIST, whole-time, or part-time for 9 notional half-days per week. Particulars may be obtained from the Director, Radiotherapy Department, General Hospital, Newcastle upon Tyne, 4. The appointee will be a member of the Regional Radiotherapy Team and will be required to visit other hospitals in the Region.

Applications, together with names and addresses of 3 referees, to be sent to the Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. South EAST NORTHUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. (Main hospitals: Preston Hospital 356 Beds; Tynemouth Victoria Jubilee Infirmary 109 Beds. Population 158,020.) SENIOR CASUALTY OFFICER (whole-time) within salary range of £1500–£50–£1950 or £1400–£50–£1950, according to age. Duration of appointment not exceeding 4 years. Appointee will be required, subject to supervision of Senior General Surgeons and Senior Orthopædic Surgeons, to organise the casualty work throughout the Hospital Group. A house is available on a rental basis.

Applications, together with names and addresses of 3 referees, to be sent to the Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6.

NORTH WEST METROPOLITAN REGIONAL HOS-PITAL BOARD.

(1) CONSULTANT ORTHOPÆDIC SURGEON (whole-time or maximum sessions), Heatherwood Orthopædic Hospital, Ascot (212 Beds). Duties will include weekly orthopædic out-patient clinics at hospitals in the Windsor Group and at Hillingdon Hospital and monthly visits to each of the Middlesex County Council School Orthopædic Clinics at Ashford, Southall, Uxbridge, Hounslow, and Teddington.

Applications by 3rd October, 1955.

(2) ASSISTANT GERIATRICIAN (whole-time), Senior Hospital Medical Officer grade, West Middlesex Hospital, Isleworth, Middlesex (1142 Beds). Candidates should have good general medical experience as well as experience in geriatric medicine.

Applications by 10th October, 1955.

Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

RUTHIN CASTLE, North Wales. The Board invites applications for the position of ASSISTANT PHYSICIAN to this Clinic. Candidates are expected to have a higher degree in medicine and to have experience as Senior Registrar or of several years in general practice. Salary, according to experience and not less than £1500 p.a. with residence.

For further particulars, apply Senior Physician, Ruthin Castle, Ruthin, Denbighshire.

OXFORD REGIONAL HOSPITAL BOARD. Consultant PSYCHIATRIST (Deputy Physician-Superintendent) to the Pewsey Mental Deficiency Hospital and Ancillary premises (960 Beds). Whole-time or maximum part-time. Residential accommodation available. Candidates must hold the D.P.M. and be familiar with the statutory responsibilities prescribed by the M.D. Acts and Regulations. The hospitals may be visited by arrangement with the Secretary, Pewsey Hospital, Pewsey, Wilts.

Applications (12 copies), stating age, qualifications, experience, and the names of 3 referees, to the Secretary, Oxford Regional Hospital Board, 43, Banbury-road, Oxford, by 24th September.

OXFORD REGIONAL HOSPITAL BOARD. Assistant RADIOTHERAPIST (Senior Hospital Medical Officer grade), whole-time, for the Northampton Area Department of Radiotherapy. Candidates should be in possession of the D.M.R. (T.) and have had wide experience in radiotherapy. The department at Northampton General Hospital may be visited by arrangement with the Medical Director.

Applications (12 copies), giving age, qualifications, experience, and naming 3 referees, to reach the Secretary, Oxford Regional Hospital Board, 43, Banbury-road, Oxford, by 15th October, 1955.

SCOTLAND. NORTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the full-time post of CONSULTANT PSYCHIATRIST AND DEPUTY PHYSICIAN-SUPERINTENDENT, Kingseat Hospital, Newmachar, Aberdeenshire. Residential accommodation is available at the Hospital.

Applications (12 copies), together with the names of 2 referees, should be submitted, before 23rd September, 1955, to the Secretary, 1, Albyn-place, Aberdeen, from whom further particulars of the appointment may be obtained.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. WEST LOTHIAN (BANGOUR) HOSPITALS BOARD OF MANAGEMENT. Applications are invited from registered medical practitioners with administrative experience for the post of MEDICAL SUPERINTENDENT on the salary scale of £1675–£75(1)–£100(2)–£1950. The duties attaching to the post include responsibility to the Board of Management for the medical administration of the following hospitals in the Group: Bangour General (772 Beds); Drumshoreland (35 Beds); Tippethill (53 Beds); Bo'ness (37 Beds); St. Michael's (114 Beds).

Applications, giving particulars of age, qualifications, and experience, together with the names and addresses of 3 referees, should be sent to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3 (from whom a note giving further information regarding the appointment is available on demand), to reach there not later than 1st October, 1955.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Whole-time ASSISTANT PSYCHIATRIST AND DEPUTY PHYSICIAN-SUPERINTENDENT, Dykebar Mental Hospital, Paisley. A house is available. Salary (at age 32 and over) on the scale £1500–£50–£1950. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, not later than 30 days after the publication of this advertisement.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of ASSISTANT OBSTETRICIAN AND GYNÆCOLOGIST (Consultant grading), for duties at the Royal Samaritan and Redlands Hospitals, Glasgow. The appointment will be part-time remunerated on the basis of 8 notional half-days per week. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, not later than 30 days after the publication of this advertisement.

CANADA. CATHERINE BOOTH MATERNITY HOSPITAL, MONTREAL. Required at above Hospital, CERTIFIED ANÆSTHESIOLOGIST possessing, or qualified for, a Quebec Licence. Honorarium or fee for service basis.

For further particulars please contact the Chief of Department of Anæsthesia, or the Medical Superintendent of Catherine Booth Hospital, 4400, Walkley-avenue, Montreal, Quebec.

CANADA. REGINA GENERAL HOSPITAL, Regina, SASKATCHEWAN. Applications invited from qualified Radiologists for post of DIRECTOR, Radiology Department, in 800-Bed active general hospital. Minimum starting salary $13,000.

For information apply Superintendent, Regina General Hospital, Regina, Saskatchewan.

CANADA. VICTORIA HOSPITAL, London, Ontario, CANADA. DIAGNOSTIC RADIOLOGIST. Applications are invited from qualified Radiologists with from 1 to 4 years teaching hospital experience, for the post of Assistant Radiologist at a 900-Bed teaching hospital. New and well-equipped Radiology Department. Attractive city and university centre. Population 100,000. Salary $6000–$12,000 p.a.

Applications to Superintendent, Victoria Hospital, London, Ontario.

JERUSALEM. THE OPHTHALMIC HOSPITAL OF ST. JOHN OF JERUSALEM, JORDAN. A WARDEN (Surgeon-in-Charge) is required in July, 1956. Salary corresponding to National Health Service Consultant scale with appropriate allowances.

For further particulars, terms of service, &c., apply to the Secretary, Order of St. John, St. John's-gate, Clerkenwell, E.C.1.

Hospital Services: Junior Appointments

BROMPTON HOSPITAL, S.W.3. Applications invited for the following posts:—

RESIDENT SURGICAL OFFICER (post graded as Senior House Officer or Registrar, according to qualifications and experience), for which there are 2 vacancies, for 6 months from 1st November, with eligibility for re-appointment. Candidates must have held a resident hospital appointment.

RESIDENT HOUSE PHYSICIAN for which there are 3 vacancies, for 6 months from 1st November. Duties include work in Outpatient Department and wards. Salary at the rate of £525 p.a.

RESIDENT HOUSE PHYSICIAN at the Sanatorium at Frimley, for 6 months from 1st November. Salary at the rate of £525 p.a.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 10th September, to KENNETH A. F. MILES, House Governor.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER required in General Surgical and Urological Department. Pre-registration appointment for 6 months from 4th October, 1955.

Applications, with copies of 2 testimonials, to Medical Director by 10th September, 1955.

CHARING CROSS HOSPITAL BOARD OF GOVERNORS. HARROW HOSPITAL. CASUALTY OFFICER (Junior Hospital Medical Officer), for period to 14th December, 1955.

Apply to Secretary, Harrow Hospital (Tel.: BYR 2232).

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) Applications are invited for the post of CASUALTY OFFICER AND DEPUTY RESIDENT SURGICAL OFFICER, graded as Senior House Officer, vacant immediately. Recognised for F.R.C.S. Salary £745 p.a., less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of FIRST HOUSE SURGEON, with charge of general surgical beds. Appointment for 6 months from 1st November, 1955. Salary according to Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 14th September, 1955.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of SECOND HOUSE PHYSICIAN. Appointment for 6 months from 1st November, 1955. Salary according to Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 14th September, 1955.

GUY'S HOSPITAL. York Clinic for Psychological MEDICINE. Required, Locum RESIDENT HOUSE PHYSICIAN (Male) for a period of 2 months from 1st October, 1955. Salary at Senior House Officer Locum rate of £14 10s. per week.

Applications, with copies of recent testimonials, should be sent to the Superintendent, Guy's Hospital, London Bridge, S.E.1, as soon as possible.

GUY'S HOSPITAL. York Clinic for Psychological MEDICINE. Required, RESIDENT HOUSE PHYSICIAN (Senior House Officer—Male) to commence duties on 1st October, 1955. The post offers good opportunities for post-graduate study. The appointment will be for 6 months in the first instance, and may be renewed for a further period.

Applications, with copies of recent testimonials, should be sent to the Superintendent, Guy's Hospital, London Bridge, S.E.1, on or before 24th September, 1955.

HACKNEY GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (anæsthetics). Applications are invited for the above 12-month appointment from 1st October. Duties shared between German Hospital (general—157 Beds) and the Mothers' Hospital (Salvation Army) (maternity—110 Beds), with residence at German Hospital. The post offers experience in general surgical anæsthesia in the group, and facilities are provided to study for higher examinations.

Apply, with testimonials, to Group Secretary, Hackney Hospital, London, E.9, quoting GMH/SHO.

HACKNEY HOSPITAL, London, E.9. (General—844 Beds.) Applications for the 12-month resident appointment of CASUALTY OFFICER (Senior House Officer grade), from 1st September, should reach the Secretary, above address, quoting HH/SCO.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. HOUSE SURGEON (general surgery) required 1st October.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary, Board of Governors, by 10th September.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from registered medical practitioners (Male) for the appointment of HOUSE SURGEON, to become vacant on Tuesday, 4th October. This post is recognised for purposes of F.R.C.S. (Eng.). Appointment will be for a period of 6 months. National Health Service salary.

Applications should reach the Secretary on or before Monday, 12th September, 1955, together with copies of 3 recent testimonials.

AMENDED ADVERTISEMENT

HÔPITAL ET DISPENSAIRE FRANÇAIS, 172, Shaftesbury-avenue, W.C.2. Applications are invited for the post of HONORARY PHYSICIAN to Outpatients with charge of beds. Candidates must be university graduates in medicine and Members or Fellows of the Royal College of Physicians and speak French fluently.

Applications should be sent to the Secretary of the Hospital on or before 30th September.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited from pre-registration and registered medical practitioners for the post of RESIDENT HOUSE PHYSICIAN, vacant 30th September.

Forms of application from the Physician-Superintendent. Stamped addressed envelope should be enclosed.

LAMBETH HOSPITAL, Kennington, S.E.11. Applications are invited from pre-registration and registered medical practitioners for the post of RESIDENT HOUSE SURGEON in the Obstetric and Gynæcological Unit, vacant on 16th October, 1955. The Hospital is recognised for the M.R.C.O.G. and the D.Obst.R.C.O.G.

Forms of application to be obtained from the Physician-Superintendent on receipt of a stamped addressed envelope.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. A vacancy occurs 1st November, 1955, for RESIDENT SURGICAL OFFICER. Appointment for 6 months, with prospect of renewal. Post graded as Senior House Officer or Registrar, according to qualifications and experience. Previous surgical experience necessary.

Applications, stating age, qualifications with dates and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 20th September.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

MILE END HOSPITAL, Bancroft-road, E.1. (475 Beds.) Applications are invited for the post of CASUALTY AND RECEIVING-WARD OFFICER (Senior House Officer).

Application forms, obtainable from the Physician-Superintendent, should be returned by 16th September, 1955, with copies of not more than 3 testimonials.

MOTHERS' HOSPITAL (Salvation Army), London, E.5. (Maternity—110 Beds.) Applications invited for 12-month resident appointment from 1st November of SENIOR HOUSE OFFICER (obstetrics). Post recognised for M.R.C.O.G.

Apply with copy testimonials, to Group Secretary, Hackney Hospital, London, E.9, quoting MH/JR.

NEW END HOSPITAL, Hampstead, N.W.3. Registrar required for General Medical Unit of 85 Beds. Post vacant 1st October, 1955. The Hospital may be visited by direct appointment with the Surgeon-Superintendent.

Application forms obtainable from, and returnable to, Group Secretary, Archway Group Hospital Management Committee, 46, Cholmeley-park, N.6, by 12th September, 1955.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

REGISTRAR in Mental Deficiency (non-resident; house available), South Ockendon Hospital, Romford, Essex. Recognised for D.P.M.

REGISTRAR in Psychiatry (resident or non-resident), Severalls Hospital, Colchester, Essex.

REGISTRAR in Diseases of the Chest (non-resident; house available), Harold Court Hospital, Harold Wood, Essex, and Brentwood Chest Clinic.

PÆDIATRIC REGISTRAR (non-resident), Queen Elizabeth Hospital for Children, E.2, and The Mothers' Hospital (Salvation Army), E.5. Experience in diseases of children essential.

REGISTRAR in General and Orthopædic Surgery (resident), Tilbury and Riverside General Hospital, Tilbury, Essex. Recognised for F.R.C.S.

MEDICAL REGISTRAR (resident), St. Michael's Hospital, Braintree, Essex.

MEDICAL REGISTRAR (resident), Tilbury and Riverside General Hospital, Tilbury, Essex.

REGISTRAR in Obstetrics (resident), Thorpe Coombe Maternity Hospital, London, E.17. Recognised for M.R.C.O.G.

Appointments subject to review after 1 year.

Separate applications in duplicate, with 2 copies of 2 recent testimonials, to Secretary, 11A, Portland-place, W.1, by 17th September, 1955.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. PSYCHIATRIC REGISTRAR for training; 5 sessions per week. Vacant from 1st October, 1955, at Child Guidance Training Centre, 6, Osnaburgh-street, N.W.1. Preference given to applicants intending to specialise in child guidance. Previous psychiatric experience essential. Clinic may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 14th September, 1955.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. Temporary SENIOR REGISTRAR in Obstetrics and Gynæcology, required for 6 months from 1st October. Residence at Maternity Annexe at Finchley. Candidates should possess M.R.C.O.G. Department consists of 140 obstetric beds (including annexe) and 60 gynæcological beds. Duties include a certain amount of teaching.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials and names of 2 referees, to Group Secretary of Hospital by 12th September.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. CASUALTY OFFICER (Senior House Officer grade). Post recognised for F.R.C.S. 6 months appointment starting 12th October. Non-resident.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials and/or names of 2 referees, to Secretary of Hospital, by 13th September.

NORTH MIDDLESEX HOSPITAL AND EDMONTON CHEST CLINIC, London, N.18. SENIOR HOUSE OFFICER (tuberculosis), resident, required for 16th October. Duties at above Hospital and Clinic under the direction of the Chest Physician. Further details on request.

Applications, stating age, nationality, qualifications, experience, together with copies of recent testimonials and/or names of 2 referees, to Secretary of Hospital, by 13th September.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. HOUSE SURGEON (post-registration) for Thoracic Unit, resident, required for 6 months from 16th October.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital, by 13th September.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited for the posts of RESIDENT MEDICAL OFFICER, appointment vacant 11th November, 1955, and HOUSE PHYSICIAN (resident), appointment vacant 23rd November, 1955, at Maida Vale Hospital for Nervous Diseases, London, W.9. Appointments in the first instance for 6 months, renewable. Grading as Senior House Officer or Registrar according to experience. Preference will be given to candidates holding a higher degree and previous neurological experience will be an asset.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary at Maida Vale Hospital, London, W.9, not later than 10th September, 1955.

PADDINGTON GREEN CHILDREN'S HOSPITAL, W.2. (ST. MARY'S HOSPITAL.) Applications are invited for the post of CASUALTY OFFICER. Post-registration appointment, House Officer grade, tenable for 6 months, as from 1st October, 1955.

Applications, stating age, nationality, qualifications with dates, and experience, with copies of 3 recent testimonials, should reach the Secretary not later than 10th September, 1955.

ROYAL FREE HOSPITAL, W.C.1. Applications are invited for the post of REGISTRAR to the X-ray Department at the Royal Free Hospital. Duties to commence on 1st November, 1955. Appointment for 1 year in the first instance. Candidates should hold the D.M.R.(D.).

Application forms may be obtained from the Secretary to the Board of Governors, the Royal Free Hospital, Gray's Inn-road, London, W.C.1, to whom they should be returned not later than 28th September, 1955.

ROYAL MASONIC HOSPITAL, Ravenescourt Park, London, W.6. Applications are invited for the post of RESIDENT MEDICAL REGISTRAR. Appointment from 1st November. Gross salary—first year £850 (residential emoluments of £130 deductible); second year £965 (residential emoluments of £145 deductible).

Please state age, qualifications, past and present appointments, and include 2 recent testimonials and/or the names of 2 referees. Applications should reach the undersigned (from whom further information may be obtained) on or before 16th September, 1955.

R. E. LAWSON, Secretary and House Governor.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, London, W.1. Applications are invited for the posts of RESIDENT SENIOR HOUSE OFFICERS (2 vacancies), for a period of 6 months. 1 to commence duties on 21st October and 1 on 24th November.

Applications to be received by 16th September. Forms of application can be obtained from the House Governor at 234, Great Portland-street, London, W.1.

ROYAL NORTHERN HOSPITAL, Holloway, London, N.7. Applications are invited for the post of SECOND RESIDENT ANÆSTHETIST (Senior House Officer grade), vacant 21st September, 1955. Appointment recognised for D.A.

Applications to be sent to the Hospital Secretary.

ROYAL NORTHERN HOSPITAL, Holloway, London, N.7. Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics and gynæcology), vacant September, 1955.

Applications to be sent to the Hospital Secretary by 10th September.

SOUTH EAST REGIONAL THORACIC SURGERY UNIT. (46 Beds.) BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. SENIOR HOUSE OFFICER, vacant mid-September. Recognised for F.R.C.S. 6-month appointment and may be renewed for a further period. The Unit treats all types of chest diseases and offers opportunity for comprehensive training in thoracic surgery.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Anæsthetics to fill a vacancy in the approved trainee establishment at the Bermondsey and Southwark Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 17th September, 1955.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. PATHOLOGICAL REGISTRAR (clinical) vacancy will occur shortly. Applications are invited from Women medical practitioners who should have had experience of laboratory work. Canvassing will disqualify but candidates are not precluded from visiting the Hospital if they so desire.

Form of application (enclosing stamped addressed envelope) from the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to whom completed applications should be returned not later than 17th September, 1955.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of MEDICAL REGISTRAR (7 sessions weekly), vacant now. The appointment will be for 1 year in the first instance. A higher qualification in medicine is desirable. Canvassing will disqualify but candidates are not precluded from visiting the Hospital.

For forms of application apply (enclosing stamped addressed envelope) to the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to whom completed forms should be returned not later than 16th September, 1955.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. (581 Beds.) Applications are invited for the post of Whole-time REGISTRAR in the Thoracic Surgical Unit. Experience in general surgery essential, and higher surgical qualifications an advantage. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Paddington Group Hospital Management Committee, Harrow-road, W.9, by 19th September, 1955.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. (581 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (casualty), resident or non-resident.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be forwarded to the Hospital Secretary immediately.

ST. GEORGE-IN-THE-EAST HOSPITAL, Raine-street, Wapping, E.1. Applications are invited for the post of HOUSE PHYSICIAN (pre- or post-registration). Post vacant 20th September, 1955. Tenable for 6 months. Salary, &c., in accordance with national scale.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Superintendent.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the temporary post of REGISTRAR to the Department of Gynæcology in the St. George's Hospital Group, for a period of about 6 months, from 1st November, 1955. Candidates should possess a higher surgical qualification.

Applications, stating age, education, qualifications, experience, and the names of 2 referees, should reach the undersigned not later than 17th September, 1955.

P. H. CONSTABLE, House Governor.

ST. GILES HOSPITAL, Camberwell, S.E.5. Applications are invited for appointment as SENIOR HOUSE OFFICER (general medical duties).

Applicants should submit details of their age, qualifications and previous posts, together with copy testimonials, to the Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, S.E.22, as soon as possible.

ST. JAMES' HOSPITAL, Balham, S.W.12. Senior House OFFICER (anæsthetics), vacant 1st October. Recognised for D.A. and F.F.A.R.C.S.

Applications, stating age, qualifications, experience, and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, at above address.

ST. MARY ABBOTS HOSPITAL, Marloes-road, Kensing-ton, W.8. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. FULHAM AND KENSINGTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for appointment as REGISTRAR (obstetrics and gynæcology) at above Hospital. Previous experience essential and preference given to candidates with a higher qualification. Post recognised for M.R.C.O.G. Candidates may visit the Hospital by arrangement.

Applications (5 copies to be completed) to be submitted by 16th September, 1955, on forms obtainable from the Group Secretary (L.150), 5, Collingham-gardens, London, S.W.5.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of Part-time OUTPATIENT SURGICAL ASSISTANT for 3 notional half-days per week (Wednesday, A.M., Friday, P.M., Saturday, A.M.) graded Senior House Officer. The appointment will be for a first period of 12 months and the successful candidate will be required to commence duties as soon as possible.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service grading of previous and present appointments, together with names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, by 21st September, 1955.

ST. THOMAS'S HOSPITAL, London, S.E.1. Research REGISTRAR to the Department of Psychological Medicine. 1 year in the first instance. Successful candidate to devote whole-time to clinical research in psychiatric treatment.

Applications, including names and addresses of 2 referees, to the Clerk of the Governors by 10th September, 1955.

ST. THOMAS'S HOSPITAL, London, S.E.1. Registrar to the Children's Department. 1 year in the first instance from 22nd November, 1955.

Applications, naming 2 referees, to the Clerk of the Governors by 17th September.

ST. THOMAS'S HOSPITAL AND THE SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. (Joint appointment.) Whole-time SENIOR MEDICAL REGISTRAR at St. Thomas's Hospital and the Southampton Group of hospitals. Subject to annual reappointment, the successful candidate will work for approximately equal periods at each of these centres.

Applications (5 copies), including names and addresses of 2 referees, to the Clerk of the Governors, St. Thomas's Hospital, S.E.1, by 17th September, 1955.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 15th December, 1955, for a HOUSE PHYSICIAN (Senior House Officer).

Further particulars and form of application, which must be returned not later than 3rd October, 1955, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 1st January, 1956, for a Part-time REGISTRAR to the Department of Psychological Medicine. The appointment is non-resident, 5 sessions weekly. Applicants should have had either previous psychiatric experience, preferably with the D.P.M. and desire to train in child psychiatry or should be experienced Pædiatricians anxious to obtain psychiatric experience in their own field.

Full particulars, with form of application, which must be returned not later than Monday, 3rd October, 1955, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

WANSTEAD HOSPITAL, Hermon Hill, E.11. (191 Beds.) Applications are invited for the post of CASUALTY OFFICER, recognised for F.R.C.S. Graded Senior House Officer. Salary £745 p.a., less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to the Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

WANSTEAD HOSPITAL, Hermon Hill, London, E.11. (191 Beds.) HOUSE SURGEON required. Post vacant now. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP. Applications are invited from fully registered medical practitioners for the post of ORTHOPÆDIC HOUSE SURGEON at above Hospital. This post, which is at present vacant, is recognised for the F.R.C.S.

Application forms from the Hospital Secretary, to whom they should be returned as soon as possible.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP. Applications are invited from fully registered medical practitioners for the post of HOUSE PHYSICIAN in General Medicine at above Hospital, which falls vacant on 1st November, 1955.

Application forms from the Hospital Secretary to be returned by 16th September, 1955.

ALTON, HAMPSHIRE. LORD MAYOR TRELOAR ORTHOPÆDIC HOSPITAL. (345 Beds.) Applications are invited from registered medical practitioners for the post of Whole-time ORTHOPÆDIC REGISTRAR, vacant in November, 1955. Post provides experience in non-pulmonary tuberculosis and general orthopædics and includes attendances at peripheral clinics. Accommodation available for single or married man. Canvassing disqualifies, but visit to Hospital welcomed.

Write to Secretary for application form.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER (Male) for special departments (E.N.T., pædiatrics, ophthalmology, dermatology, &c.). 6-month appointment, now vacant. Offers good experience before general practice. Not suitable for pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE PHYSICIAN (Male) for general medical duties. 6-month appointment vacant 1st October, 1955. Preference given to pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital, by 10th September, 1955.

AYLESBURY, BUCKINGHAMSHIRE. STOKE MANDE-VILLE HOSPITAL. Applications are invited for the post of RESIDENT HOUSE PHYSICIAN in the Department of Medicine. Pre-registration post but registered practitioners may apply. Duties include responsibility for 15 tuberculosis beds. Post vacant 2nd October, 1955.

Applications, with copies of 2 testimonials, to the Administrative Officer.

AYLESBURY, BUCKINGHAMSHIRE. ROYAL BUCK-INGHAMSHIRE AND ASSOCIATED HOSPITALS MANAGEMENT COMMITTEE. Applicants are invited for the post of SENIOR HOUSE OFFICER (anæsthetics) to the Department of Anæsthetics for the Aylesbury Group of hospitals. Recognised for D.A. and F.F.A.R.C.S. Salary £745 p.a., with an appropriate deduction (maximum of £150 p.a.) if resident.

Applications, giving full details of experience, and 2 names for reference, to the Secretary to the Management Committee, 9, Bicester-road, Aylesbury.

BARNSLEY. BECKETT HOSPITAL. (178 Beds. Recog-nised for the F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (orthopædics) required. Post vacant 8th November, 1955. Single accommodation available. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th September, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

BARROW-IN-FURNESS. NORTH LONSDALE HOS-PITAL. Applications are invited for a post of SENIOR HOUSE PHYSICIAN at the North Lonsdale Hospital, Barrow-in-Furness. National conditions and salary scale.

Applications to Group Secretary, Barrow and Furness Hospital Management Committee, 52, Paradise-street, Barrow-in-Furness.

BARRY ACCIDENT AND SURGICAL HOSPITAL. SENIOR HOUSE OFFICER required immediately at above Hospital. Staffed by whole-time Consultant Surgeon and Senior Casualty Officer. Excellent experience given in general surgery.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

BEXHILL HOSPITAL, Bexhill. (62 Beds.) House SURGEON required. Not pre-registration. National scale of salary.

Apply to Hospital Administrator.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. Locum SURGICAL REGISTRAR (resident) for about 4 weeks from 15th September.

Applications, giving full details, and naming 2 referees, to Group Secretary, Birmingham (Selly Oak) Hospital Management Committee, Oak Tree-lane, Birmingham, 29.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. Locum SENIOR HOUSE OFFICER (anæsthetics). Residential duties for period 8th–30th September.

Applications to Administrator, naming 2 referees.

BIRMINGHAM AND MIDLAND EAR AND THROAT HOSPITAL, Edmund-street, BIRMINGHAM, 3. HOUSE OFFICER required. Pre-registration considered.

Detailed applications, with copies of 2 recent testimonials, to Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (780 Beds.) SENIOR HOUSE OFFICER (anæsthetics), resident, required 1st October. Recognised for D.A. and F.F.A.R.C.S. Extensive experience in anæsthetics not necessary. Duties include list and emergency work in general surgery, gynæcology, obstetrics, and E.N.T. at hospitals in Group.

Detailed applications, with copies of 3 recent testimonials, to Secretary.

BIRMINGHAM. MARSTON GREEN MATERNITY HOSPITAL, Berwicks-lane, MARSTON GREEN, near BIRMINGHAM. HOUSE SURGEON (obstetrics) required 1st November, 1955. 121 obstetric and 10 gynæcological beds. Recognised for Diploma and Obstetric part of M.R.C.O.G. Premature Baby Unit. Affiliated to Birmingham Medical School for training of students.

Detailed applications, with copies of 3 recent testimonials, to Secretary.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) Shrewsbury Group, Royal Salop Infirmary, Shrewsbury

REGISTRAR (anæsthetics) for Shrewsbury Group and Robert Jones and Agnes Hunt Orthopædic Hospital. Resident/non-resident. Recognised D.A. and F.F.A.R.C.S. Duties mainly in Shrewsbury Group.

(2) West Bromwich District Group, Edward-street, West Bromwich

REGISTRAR in Neurosurgery for Midland Centre for Neurosurgery, Smethwick Hospital. Considerable experience general surgery essential; neurosurgical experience an advantage.

Application forms from Group Secretaries, to be returned before 19th September, 1955. Candidates may visit hospitals.

BIRMINGHAM. SELLY OAK GROUP LABORATORY. SENIOR HOUSE OFFICER (pathology), resident. Previous experience in pathology not essential. Duties include emergency calls, particularly for blood grouping. Wide general experience provided.

Applications and full details to Group Pathologist, Selly Oak Hospital, Birmingham, 29.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. GENERAL HOSPITAL. Applications are invited for the post of MEDICAL REGISTRAR (Registrar grade). The post is tenable for 1 year in the first instance. Candidates should have the M.R.C.P. (London). The successful candidate may be required to be resident.

Forms of application may be obtained from, and should be returned not later than 17th September, 1955, to, the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15.

BIRMINGHAM. UNITED BIRMINGHAM HOSPITALS, BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN, Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. Applications are invited from registered medical practitioners for the post of RESIDENT GYNÆCOLOGICAL HOUSE SURGEON for duty with the Professorial Unit from 1st December, 1955. The appointment is recognised for the M.R.C.O.G. and D.Obst. R.C.O.G.

Application forms, obtainable from the House Governor at the above address, to be returned not later than 19th September, 1955. G. A. PHALP, Secretary.

BLACKBURN AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE.

Queen's Park Hospital, Blackburn (644 general beds) SENIOR HOUSE OFFICER (medicine) required 4th October, 1955.

HOUSE SURGEON required 1st November. Post recognised for F.R.C.S. and approved for pre-registration purposes.

Royal Infirmary, Blackburn (262 general beds)

HOUSE SURGEONS (3) required. 1 post vacant end of September and 2 vacant middle October. Posts recognised for F.R.C.S. and approved for pre-registration purposes.

JUNIOR HOSPITAL MEDICAL OFFICER (orthopædics and casualty) required 8th October. Post is of limited tenure of up to 4 years and is recognised for F.R.C.S.

Apply to Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. MEDICAL RESEARCH ASSISTANT (Registrar status) required for the Cardiac Department, Poole General Hospital. Salary £850 or £965 p.a., in accordance with the prescribed conditions for the appointment of Registrars. The successful applicant will work with and under the direction of the Physician in charge of the Cardiac Department and will be engaged entirely in research work.

Applications, stating age, nationality, qualifications, details of experience and the names of 3 referees, should be sent within 10 days of the appearance of this advertisement to the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, BOSCOMBE. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE PHYSICIAN. The appointment which is recognised for pre-registration purposes becomes vacant on 6th October.

Applications to the Deputy Hospital Secretary.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

The Royal Infirmary, Bolton (237 Beds)

RESIDENT SENIOR HOUSE OFFICER in Orthopædic Surgery. Tenable for 12 months and recognised for F.R.C.S.

Bolton District General Hospital (604 Beds)

RESIDENT SENIOR HOUSE OFFICER in Medicine. Tenable for 12 months.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, should be sent immediately to Group Secretary, The Royal Infirmary, Bolton.

BRIDGE OF EARN HOSPITAL, Perthshire. The following post will fall vacant on 1st October, 1955:—

HOUSE SURGEON or SENIOR HOUSE SURGEON (Fracture and Orthopædic Unit).

Grade will be according to experience. Junior post is recognised for Pre-registration Hospital Service. Both grades recognised by Royal College of Surgeons under regulations for the F.R.C.S.

Applications, giving age, qualifications, experience, and the names of 2 referees, should be sent to the Group Medical Superintendent, Perth Royal Infirmary, Perth.

BRISTOL. UNITED BRISTOL HOSPITALS. Bristol ROYAL INFIRMARY. Applications are invited for the post of RESIDENT SENIOR CASUALTY OFFICER (Senior House Officer grade). The appointment is for 6 months from 1st October, 1955, with a possibility of extension to 12 months, and the post is recognised for the F.R.C.S.

Applications, together with the names of 2 referees, should be sent by 17th September, 1955, to Secretary to the Board, Bristol Royal Infirmary, Bristol, 2.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) HOUSE SURGEON (first, second, or third post), vacant shortly. General surgical duties, some orthopædics. Offering good opportunity for general experience in busy acute General Hospital. Married quarters available. Recognised for F.R.C.S. Approved pre-registration post. Fully qualified practitioners may apply.

Applications to Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) ORTHOPÆDIC HOUSE SURGEON (first, second, or third post). Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S.

Apply to Group Secretary.

CAMBRIDGE. FULBOURN HOSPITAL. Senior House OFFICER (resident or non-resident). Previous psychiatric experience not required. This Hospital of 966 Beds is linked with the Cambridge University Department of Psychology and Addenbrooke's Hospital, and provides a basic psychiatric training leading to the D.P.M.

Applications, stating age, qualifications and experience, with names of 2 referees, should be sent to—

Dr. D. H. CLARK, Medical Superintendent.

Fulbourn Hospital, near Cambridge.

CANTERBURY. KENT AND CANTERBURY HOS-PITAL. (276 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (casualty), which becomes vacant early in October, 1955. Salary £745 p.a. Recognised for the F.R.C.S.

Applications to be sent to the Hospital Secretary at the above Hospital, together with copies of 3 recent testimonials.

CANTERBURY. KENT AND CANTERBURY HOS-PITAL. (276 Beds.) GENERAL SURGICAL AND UROLOGICAL HOUSE SURGEON (pre-registration or third post). The above post, which is recognised for the F.R.C.S., becomes vacant early in October, 1955. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF. THE UNITED CARDIFF HOSPITALS AND THE WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the joint appointment of a SENIOR MEDICAL REGISTRAR. The successful candidate will spend part of his time in the Region.

Application forms, which can be obtained from the Secretary, United Cardiff Hospitals, Cardiff Royal Infirmary, Cardiff, should be returned within 14 days from the appearance of this advertisement.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. (711 Beds.) RADIOLOGICAL REGISTRAR (non-resident) required as soon as possible. Candidates may visit the Hospital by arrangement.

Application forms, which should be returned duly completed by 17th September, may be obtained from the Group Secretary at the above address.

CHEPSTOW, MONMOUTHSHIRE. PLASTIC SUR-GERY, JAW INJURIES AND BURNS CENTRE, ST. LAWRENCE HOSPITAL. (109 plastic surgery, 50 orthopædic beds.) SENIOR HOUSE OFFICER in Plastic Surgery required. Previous experience in specialty not essential. The Hospital intakes from most of Wales and the successful candidate will receive a thorough training. Second Senior House Officer in plastic surgery recently appointed and there is also a Senior House Officer in orthopædics, Senior Registrar non-resident, and 2 Registrars, all in plastic surgery, resident. Salary £745, less £150 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport, Mon.

CHEPSTOW, MONMOUTHSHIRE. MOUNT PLEASANT HOSPITAL. (156 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required at above War Pensioners' Hospital. National Health Service terms and conditions.

Forms of application may be obtained from the Medical Superintendent at above address.

CHELMSFORD AND ESSEX HOSPITAL. (162 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON (pre-registration post). The post will become vacant on 29th September, and offers good surgical experience and is recognised for the F.R.C.S.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) RESIDENT HOUSE SURGEON (Senior House Officer or Intern) required for the Gynæcological (30 Beds) and E.N.T. (16 Beds) Departments. Duties to commence 17th September, 1955. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, as soon as possible.

CHESTER. BARROWMORE HOSPITAL, Great Barrow, CHESTER. (173 Beds.) Male SENIOR HOUSE OFFICER (medical). Post vacant 1st October, 1955. Salary £745, less £145 p.a. for residence. The Hospital is modern in all respects and contains Regional Thoracic Surgical Unit. Applications from ex-patients considered.

Apply, with names of 2 referees, to Physician-Superintendent.

CHESTERFIELD ROYAL HOSPITAL. Senior House OFFICER required at above Hospital for Accident and Orthopædic and Casualty Departments. Post recognised for F.R.C.S. training and offers valuable experience. National salary and conditions.

Apply M. H. BOONE, Secretary, Chesterfield Hospital Management Committee.

CHESTERFIELD HOSPITAL MANAGEMENT COMMITTEE. Whole-time NON-RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER required for Whittington Hall, Chesterfield (372 female mentally deficient patients), and Scarsdale Hospital, Chesterfield. Salary scale now £775–£50–£1075 p.a.

Apply M. H. BOONE, Secretary, at Chesterfield Royal Hospital.

CHESTER-LE-STREET. GENERAL HOSPITAL. Senior HOUSE OFFICER (general medicine) required. This post is vacant now in a hospital providing progressive treatment for acute and chronic cases.

Applications, with particulars of previous experience and names of 2 referees, to Group Secretary, Dryburn Hospital, Durham, as soon as possible.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 Beds.) CHICHESTER HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Locum SURGICAL REGISTRAR (Resident Surgical Officer) required at above Hospital for 14 days in October. Residents—4 surgical, 2 medical, 2 anæsthetists. 120 surgical beds. Salary £17 10s. a week, less £165 p.a. (£3 3s. 6d. a week) for residence.

Apply Group Secretary, 174, Broyle-road, Chichester.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. BLACK NOTLEY HOSPITAL, BRAINTREE, AND ESSEX COUNTY HOSPITAL, COLCHESTER. Applications invited for post of HOUSE SURGEON (first, second, third, or pre-registration post); tenable for 6 months. Duties to include work in general surgical and gynæcological wards. Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COTTINGHAM, near HULL. CASTLE HILL HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER to work in Major Thoracic Surgery Unit. Residential accommodation available. The Unit has 50 Beds for all types of thoracic surgery, including tuberculous and non-tuberculous, œsophageal, and cardiac.

Applications, with names of referees, to Group Secretary, Hull B Hospital Management Committee, De la Pole Hospital, Willerby, East Yorkshire.

CUPAR, FIFE. STRATHEDEN HOSPITAL. Applications are invited for 2 vacancies for HOUSE OFFICERS. Pre-registration candidates will be considered. This mental hospital (1125 Beds) provides experience in all branches of psychiatry. There are adult outpatient and child psychiatric clinics covering the County of Fife. A modern hospital with operating-theatre provides facilities for the practice of the latest treatment.

Applications, giving personal particulars, qualifications and experience, together with names and addresses of 2 referees, to be submitted to the Physician-Superintendent.

DERBY. DERBYSHIRE HOSPITAL FOR WOMEN, Friar Gate, DERBY. (60 Beds.) HOUSE SURGEON (pre-registration) or SENIOR HOUSE OFFICER (gynæcology), vacant immediately. Recognised as pre-registration post in surgery.

Apply, stating age, experience and whether pre-registration, with 2 copy testimonials, to Group Secretary, No. 1 Hospital Management Committee, Babington-lane, Derby.

DONCASTER ROYAL INFIRMARY. Sheffield Regional HOSPITAL BOARD. Whole-time SENIOR ORTHOPÆDIC REGISTRAR (transitional appointment) required for 1 year in first instance at the above Infirmary. Applications invited from Senior Orthopædic Registrars in their fourth or subsequent years and from those who held such posts for 3 years or more but vacated them after 1st January, 1951.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, to arrive not later than 12th September, 1955.

DONCASTER ROYAL INFIRMARY. (330 Beds.) DONCASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT ANÆSTHETIST in the grade of Senior House Officer.

Applications to the Secretary to the Committee at Doncaster Royal Infirmary.

DOUGLAS, I.O.M. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for post of HOUSE PHYSICIAN at this busy Hospital, which has been approved for Pre-registration Service. The post, which becomes vacant 1st October, 1955, offers varied experience. 4 residents on the staff. Salary scale £425–£475–£525, according to experience.

Applications, stating full details, with copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DRIFFIELD, YORKSHIRE. NORTHFIELD SANATORIUM. (78 Beds.) SENIOR HOUSE PHYSICIAN. Vacant early October. Offers experience all branches of tuberculosis within Group, including surgery, mass miniature radiography, and clinics. Time for study. Ex-patients welcome. £165 for full residence.

Applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. (1) MEDICAL REGISTRAR, Papworth Hospital, Cambridgeshire. Duties in both Medical and Thoracic Surgical Departments. Post provides good experience in tuberculosis and other chest diseases. Appointment for 1 year, renewable for second year. Candidates invited to visit Hospital by direct arrangement with Physician-Superintendent.

(2) ORTHOPÆDIC REGISTRAR, Norfolk and Norwich Hospital (441 Beds). Post provides excellent training. Appointment for 1 year, renewable for second year. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

Applications, stating age, experience, and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 19th September, 1955.

EBBW VALE GENERAL HOSPITAL. (General beds 71, maternity 15.) Applications are invited for the following appointments:—

(*a*) JUNIOR HOSPITAL MEDICAL OFFICER.

(*b*) SENIOR HOUSE OFFICER.

The Hospital is an active Surgical Unit and the medical staff consists of a resident Surgeon and visiting orthopædic, gynæcological, and ophthalmic Surgeons.

The tenure of appointment shall be for:—

(*a*) a period not exceeding 4 years; and

(*b*) a period of 12 months.

Apply giving full details and references to Group Secretary, North Monmouthshire Hospital Management Committee, Nevill Hall Hospital, Abergavenny, Mon.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT SENIOR CASUALTY HOUSE OFFICER required at above Hospital. Post vacant 7th October, 1955. Salary £745 p.a. Deduction of £155 p.a. for board, residence, &c.

Apply immediately, stating age, nationality, qualifications and experience, together with the names and addresses of 2 referees, to Group Secretary, Edgware General Hospital.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. Appointment of RESIDENT HOUSE SURGEON (approved pre-registration post), vacant 25th October, 1955. General surgical duties. 6-month appointment.

Applications to the Secretary of the Management Committee as soon as possible.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from pre-registration and registered medical practitioners for the appointment of HOUSE PHYSICIANS (2), vacant 8th October, 1955, and 19th October, 1955.

Applications, with copies of 2 recent testimonials, to the Hospital Secretary by 10th September, 1955.

FARNBOROUGH HOSPITAL, Farnborough, Kent. (800 general beds.) SENIOR HOUSE OFFICER (E.N.T.) for department with 4 specialist operating sessions, 5 outpatient clinics and diagnostic hearing-aid centre. Recognised for D.L.O. Deduction for residence £150 a year.

Apply, stating age, qualifications and experience, and naming 3 referees, to the Administrative Officer.

GLASGOW ROYAL INFIRMARY. Senior House Officer in Orthopædics. Duties at above Infirmary.

Write, giving 3 names for reference, not later than 17th September, 1955, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

HEREFORD. COUNTY HOSPITAL. (335 Beds.) House OFFICER (general surgery) required.

Applications, with copies of 2 recent testimonials, to be sent to the Medical Superintendent, County Hospital, Hereford.

HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in the E.N.T. Departments of the Victoria Hospital for Sick Children and the Hull Royal Infirmary. The post which will become vacant on 1st September, 1955, counts towards the F.R.C.S. and D.L.O.

Applications, with testimonials, should be sent to the Secretary, Victoria Hospital for Sick Children, Park-street, Hull.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street, HULL. Locum SENIOR HOUSE OFFICER required from 11th September to 9th October, 1955. Duties mainly in Casualty Department.

Applications should be sent to the Hospital Secretary, Hull A Group Hospital Management Committee, at the above address.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) SENIOR HOUSE OFFICER (casualty and orthopædic) required. Post vacant 1st September, 1955. National scale of salary.

Apply to Hospital Administrator.

HENLEY-ON-THAMES, OXFORDSHIRE. PEPPARD CHEST HOSPITAL. (236 Beds.) Applications are invited for post of JUNIOR HOSPITAL MEDICAL OFFICER (resident), vacant immediately. Salary and conditions of service as recommended by Ministry of Health. Deductions for residence, &c., £150 p.a. Further particulars from Physician-Superintendent at Hospital.

Applications, stating age, nationality, qualifications with dates, present post, with copies of recent testimonials, to Acting Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading.

HITCHIN, HERTFORDSHIRE. NORTH HERTS HOSPITAL. Applications are invited for the post of RESIDENT HOUSE SURGEON, vacant 18th October, 1955. Recognised as pre-registration post and for F.R.C.S.

Applications, stating age, nationality, qualifications, and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator, Lister Hospital, Hitchin, as soon as possible.

HITCHIN, HERTFORDSHIRE. LISTER HOSPITAL. Applications are invited for the post of RESIDENT HOUSE SURGEON, vacant 6th October, 1955. Recognised as pre-registration post and for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator as soon as possible.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) Applications are invited from provisionally registered or registered medical practitioners for the post of HOUSE PHYSICIAN, to commence duties immediately. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.

Huddersfield Hospital Management Committee,
The Royal Infirmary, Huddersfield.

INVERNESS. RAIGMORE HOSPITAL. Board of MANAGEMENT FOR INVERNESS HOSPITALS. ORTHOPÆDIC HOUSE SURGEON required for 6 months from 1st October, 1955. Orthopædic Department 140 Beds. Whitley Council salary and conditions of service. Post recognised for pre-registration training.

Applications, with references, to Medical Superintendent.

INVERNESS. RAIGMORE HOSPITAL. Board of MANAGEMENT FOR INVERNESS HOSPITALS. HOUSE PHYSICIAN (pædiatrics) required from 1st October, 1955. Whitley Council salary and conditions of service. Post recognised for pre-registration.

Applications, with references, to Medical Superintendent.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department, vacant from 1st October, 1955. Approved pre-registration post.

Applications, with copies of recent testimonials, to the Hospital Secretary.

IPSWICH. ST. HELEN'S HOSPITAL. (100 Beds for infectious diseases, pulmonary tuberculosis and long-stay orthopædics. The Area Chest Clinic is in the Hospital.) HOUSE PHYSICIAN required (post-registration appointment). Accommodation available for married man.

Applications to JOHN WILLIAMS, Group Secretary, Ipswich Group Hospital Management Committee, at the Ipswich and East Suffolk Hospital (Anglesea Road Wing), Ipswich.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. South WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. Pre-registration HOUSE OFFICER required for Orthopædic Unit. Post recognised for F.R.C.S. Resident.

Applications, stating age, nationality, qualifications obtained with copies of up to 2 recent testimonials, to Group Secretary, West Middlesex Hospital, Isleworth, Middlesex, by 14th September 1955.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. House OFFICER for Geriatric Unit. Resident. Full-time. Post offers excellent experience in general medicine.

Applications, stating age, nationality, qualifications and experience, with copies of up to 3 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 13th September, 1955.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. Senior HOUSE OFFICER required for Dermatological Unit. Candidates must have held medical and surgical house posts and previous experience in dermatology desirable. Post suitable for anyone intending to specialise in this subject.

Applications, stating age, nationality, qualifications and experience, with copies of up to 3 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 16th September, 1955.

KIDDERMINSTER AND DISTRICT GENERAL HOSPITAL. (112 Beds.) HOUSE SURGEON (not pre-registration) required at the above Hospital.

Applications (in writing), with the names of 3 referees, to the Hospital Secretary.

LIVERPOOL, 18. MOSSLEY HILL HOSPITAL. (148 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (surgical) required immediately at above War Pensioner's Hospital. National Health Service terms and conditions.

Forms of application may be obtained from the Medical Superintendent.

LIVERPOOL, 14. BROADGREEN HOSPITAL. Applications are invited for the post of ADMISSION ROOM AND CASUALTY OFFICER, tenable from 1st October, 1955. The grading of the post will be either Senior House Officer or House Officer according to the experience and qualifications of the applicant appointed. The post is recognised for pre-registration purposes and is non-resident. Salary will be: Senior House Officer grade £745 p.a., House Officer grade £425–£475–£525 p.a., according to experience.

Applications, on forms obtainable from the undersigned, should be returned completed not later than Monday, 12th September, 1955. H. BLYTHE, Group Secretary.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a post of SENIOR REGISTRAR in Radiology for the period to 30th September, 1956. Annual reappointment thereafter until completion of the normal period of training will be considered without need for further application.

Apply by 17th September, 1955, on form obtainable from the Secretary, 80, Rodney-street, Liverpool, 1.

LUTON AND DUNSTABLE HOSPITAL. (250 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (resident) required at above Hospital and associated units (134 Beds). Post vacant 25th September, 1955, and recognised for D.A. The Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds, by 20th September, 1955.

LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER (anæsthetics) for duties mainly at St. James's Hospital, vacant 1st October, 1955. The appointment which is recognised for the D.A. and the F.F.A. R.C.S., will be for a period of 1 year, and the salary will be in accordance with the agreed terms and conditions of service of hospital medical and dental staffs—namely, £745 p.a., with an appropriate deduction in respect of board, lodging, and other services provided.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS, 2. PUBLIC DISPENSARY AND HOSPITAL. LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER (Senior House Officer) at the above Hospital. The appointment, which is recognised by the Royal College of Surgeons for Fellowship, will be for a period of 1 year. Salary in accordance with the agreed terms and conditions of service of hospital medical and dental staffs, with an appropriate deduction in respect of board, lodging, &c.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS REGIONAL HOSPITAL BOARD. Short-term LOCUM TENENS appointments in the Registrar grade are constantly available at hospitals in the area of the Board, particularly in the specialties of anæsthetics, general medicine, general and orthopædic surgery, and psychiatry.

Interested practitioners, suitably experienced, should communicate with the Secretary, Joint Registrars Committee, Park-parade, Harrogate.

LEEDS REGIONAL HOSPITAL BOARD. Senior Regis-TRAR vacancies.

Anæsthetics

(*a*) Hull A Group of hospitals with additional duties as required in Hull B and East Riding Groups. Non-resident.

(*b*) St. James's Hospital, Leeds, with additional duties at hospitals in the Leeds A and B Groups. Non-resident.

Ophthalmology

Hull A Group, with additional duties as required in Hull B and East Riding Groups. (34 eye beds—3000 new and 12,500 total outpatients p.a.) Non-resident.

Pathology

(*a*) St. James's Hospital, Leeds (1800 Beds), and at other units in the Leeds A and B Groups and the Regional Blood Transfusion Centre. Experience of morbid anatomy essential. The work would be so arranged that some time could be devoted to research problems.

(*b*) Regional Blood Transfusion Centre, Seacroft, with minor relief duties in general pathology at St. James's Hospital, Leeds. 52,000 pints of blood taken annually. Previous experience in all branches of pathology desirable. Non-resident.

Psychiatry

(*a*) 5 sessions as Trainee Specialist in Child Psychiatry at the University Department of Psychiatry at the General Infirmary at Leeds and the remainder of the time in mental deficiency at the Westwood Hospital, Bradford, and associated colonies. Accommodation available for a single person. May be non-resident, in which case the person appointed should reside in Bradford. Candidates must hold the D.P.M., or equivalent qualification.

(*b*) Stanley Royd Hospital, Wakefield (2000 Beds), and associated clinics. Accommodation for a single person is available. It is anticipated that the successful candidate will undertake 2 clinical sessions (which may include research) in association with the Department of Psychiatry of the University of Leeds. Candidates must hold the D.P.M. or equivalent qualification.

Applications, stating age, qualifications and details of appointments held, showing dates, with names and addresses of 3 referees, to the Deputy Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 16th September, 1955.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Anæsthetics

Bradford A and B Groups. Preferably resident. Recognised for the F.F.A. R.C.S. Approximately 700 Beds in the surgical specialties. Establishment—1 Senior Registrar and 2 Registrars.

General Medicine

Regional Rheumatism Centre, Harrogate (240 Beds) (9 sessions) and the Rheumatism Clinic, General Infirmary at Leeds (2 sessions). Resident at Royal Bath Hospital, Harrogate.

General Surgery

(*a*) Harrogate and District General Hospital (50 Beds). Preferably resident. Recognised for F.R.C.S.

(*b*) Bradford A Group, mainly at the Bradford Royal Infirmary (180 Beds). Residential accommodation available. Recognised for F.R.C.S.

Otolaryngology

York County and City Hospitals (30 E.N.T. beds). Resident or non-resident.

Psychiatry

(*a*) Broadgate Hospital, Beverley (600 Beds). Accommodation for single person. Resident or non-resident.

(*b*) De la Pole Hospital, Willerby (1000 Beds), and associated clinics. Resident or non-resident.

(*c*) York A Group, duties mainly at Bootham Park (202 Beds) near centre of City of York. Accommodation for single person. Resident or non-resident.

If desired, facilities for attendance at Leeds University will be provided if the successful candidates are studying for the D.P.M.

Applications stating age, qualifications and details of appointments held showing dates, with names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 8th September, 1955.

LEEDS, 9. ST. JAMES'S HOSPITAL. Applications are invited from registered medical practitioners (Male and Female) for the appointment of SENIOR HOUSE OFFICER (psychiatry), vacant 1st November, 1955. The department consists of emergency admission wards and units for the treatment of early psychotic and neurotic cases. There is a large outpatient commitment. The Unit is recognised as affording suitable training for the D.P.M. examination and facilities will be provided for attendance at courses for this examination at Leeds University. The appointment will be for a period of 1 year and the salary will be in accordance with the agreed terms and conditions of service of hospital medical and dental staffs —namely, £745 p.a., with an appropriate deduction in respect of board, lodgings, and other services provided.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee,
Leeds A Group Hospital Management Committee.
Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS, 7. CHAPEL ALLERTON HOSPITAL. (256 Beds.) REGISTRAR (general surgery and orthopædics) required for whole-time duty. National Health Service terms and conditions of service.

Detailed applications (9 copies), giving nationality, date of birth, qualifications and experience, including present appointments and the names of 3 referees, should reach Ministry of Health, Hospital Management Branch, Norcross, Blackpool, Lancashire, by 24th September, 1955.

LEEDS. UNITED LEEDS HOSPITALS/LEEDS REGIONAL HOSPITAL BOARD. REGISTRAR vacancies.

Genito-urinary Surgery

Outpatient and Diagnostic Department and 20 beds at the General Infirmary at Leeds and 40 Beds at St. James's Hospital, Leeds.

Thoracic Surgery

2 similar appointments. First year normally at the Regional Thoracic Centre, Pinderfields General Hospital, Wakefield (56 Beds), which is under the charge of the Consultants to the Teaching Hospital. Second year at the General Infirmary at Leeds. Successful candidates will be required to be resident whilst at Pinderfields Hospital. Married quarters available.

Applications, stating age, qualifications, and details of appointments held showing dates, with names and addresses of 3 referees, to the Deputy Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 15th September, 1955.

LLANELLY HOSPITAL, Llanelly, Carmarthenshire. (184 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER in the Gynæcological Department, with duties in the E.N.T. and Ophthalmic Departments.

Full particulars, stating age, qualifications and experience, should be addressed to the Hospital Secretary.

LLANELLY HOSPITAL, Llanelly, Carmarthenshire. GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER for work in the Surgical Unit of 75 Beds. The post offers excellent experience in general surgery and the Hospital is recognised under the F.R.C.S. regulations. The successful candidate will also be expected to participate in the general work of the Hospital.

Full particulars, stating age, experience and qualifications, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary.

LLANELLY HOSPITAL, Llanelly, Carmarthenshire. GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER in the Casualty Department of the above Hospital.

Full particulars, stating age, experience and qualifications, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary.

MAIDENHEAD HOSPITAL, St. Luke's-road, Maidenhead. Applications invited from registered practitioners for the post of CASUALTY OFFICER, vacant now. Post recognised for F.R.C.S. Salary on House Officer scale, plus £50 p.a.

Applications, stating age, qualifications, and nationality with copies of testimonials or names of 3 referees, to Hospital Secretary.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the E.N.T. Department of the above Hospital. There are 55 E.N.T. beds and 6 specialist operating sessions each week. Valuable experience is available, and the post is recognised for the purpose of the F.R.C.S. and the D.L.O. Salary will be £745 a year, less £150 a year for residential emoluments.

Applications immediately to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Maidstone, Kent.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RECEIVING ROOM OFFICER. Salary £745 a year, with a deduction of £150 a year for residential emoluments.

Applications to the Administrative Officer at the Hospital as soon as possible.

MANCHESTER, 8. CRUMPSALL HOSPITAL. (1225 Beds.) NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER to the Psychiatric Department at the above General Hospital. This Department offers experience in all branches of psychiatric illness, including all modern methods of treatment. Facilities available for candidates taking Diploma in Psychiatric Medicine. Experience not essential.

Applications, with names of 2 referees, by 20th September to Group Secretary, Crumpsall Hospital, Manchester, 8.

MANCHESTER. CRUMPSALL HOSPITAL. (Acute—1225 Beds.) NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of REGISTRAR in the Department of Neurosurgery at the above Hospital. The holder of the post will be allowed more scope than is usual in larger departments.

Applications, with full details and the names of 2 referees to Group Secretary, Crumpsall Hospital, Manchester, 8.

MANCHESTER, 8. CRUMPSALL HOSPITAL. Applications are invited for the post of REGISTRAR in Medicine (Resident Medical Officer). The clinical teaching of undergraduates takes place on the medical side of the Hospital.

Applications, with full details, and names of 2 referees, by 13th September, 1955, to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

MANCHESTER REGIONAL HOSPITAL BOARD. REGISTRAR in General Medicine to the Bolton and District Group of hospitals, with main duties at Bolton District General Hospital and Bolton Royal Infirmary. Now vacant.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, should be sent immediately to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

MANCHESTER. ROYAL MANCHESTER CHILDREN'S HOSPITAL. MANCHESTER REGIONAL HOSPITAL BOARD. SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar grade), falling vacant 1st October, 1955. Previous experience in surgery essential. The Hospital is the chief teaching unit of the University Department of Child Health and the post gives ample opportunity for experience in all branches of surgery in children.

Applications, stating age, nationality and experience, together with names of 3 referees, to be forwarded to the Group Secretary, Salford Royal Hospital, Chapel-street, Salford, 3, to be received not later than 15th September, 1955.

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL. (Non-sectarian, 104 Beds.) Applications are invited for the resident post of SENIOR HOUSE OFFICER in Medicine at the above Hospital.

Applications, with names of 2 referees, immediately to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

MITCHAM JUNCTION, SURREY. WANDLE VALLEY HOSPITAL. RESIDENT MEDICAL OFFICER (Senior House Officer grade). Vacant now. The hospital contains 140 Beds for infectious diseases and geriatric cases.

Applications, stating age, qualifications and experience, with the names of referees, should be sent to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

MONTROSE, ANGUS. ROYAL MENTAL HOSPITAL. (944 Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female). A self-contained house or furnished flat is available for a married man. Single furnished quarters are also available. All subject to appropriate deductions. There is a well-equipped pathological and biochemical laboratory. Previous experience in psychiatry is not essential. Salary and conditions of service in accordance with national scale.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, should be forwarded immediately to the Physician-Superintendent.

NOTTINGHAM GENERAL HOSPITAL. Resident House SURGEON (pre-registration first or second post) required; duties to commence on 13th September. Recognised for F.R.C.S.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (casualty). Establishment 3. Recognised for the F.R.C.S. Duties to commence 15th October. Post offers wide experience of casualty work.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR ORTHOPÆDIC AND FRACTURE HOUSE OFFICER, duties to commence about end August. The post offers exceptional experience in traumatic surgery. Salary and conditions of service in accordance with Ministry Regulations.

Applications, stating age, qualifications and experience, nationality, &c., together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM. PLASTIC SURGERY JAW INJURIES AND BURNS CENTRE, CITY HOSPITAL, NOTTINGHAM. SENIOR HOUSE OFFICER in Plastic Surgery. Previous experience in specialty not essential. The successful candidate will receive a thorough training in plastic surgery and burns. Hospital intakes from Nottingham and Derby areas. Salary £745, less £150 board-residence.

Applications, together with copies of 3 recent testimonials, should be forwarded to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM CHILDREN'S HOSPITAL. (136 Beds.) (Recognised for the D.C.H.) Applications are invited for the post of RESIDENT HOUSE SURGEON (casualty) which falls vacant early in September. The post is tenable for 6 months.

Applications, with copies of 2 testimonials, should be sent to the Secretary, Nottingham Children's Hospital, Chestnut-grove, Nottingham.

NOTTINGHAM CITY HOSPITAL AND SKIN CLINIC. SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (dermatology) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th September, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM. CITY HOSPITAL. (804 Beds.) GYNÆCOLOGICAL HOUSE OFFICER. (Recognised for pre-registration purposes.) Applications are invited for the above post, which will be graded Senior House Officer or House Officer n accordance with experience. Recognised for M.R.C.O.G. Post vacant on 6th October.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NEWCASTLE REGIONAL HOSPITAL BOARD. REGISTRAR ORTHOPÆDIC SURGEON (whole-time) at Sunderland Orthopædic and Accident Hospital (120 Beds) and Grindon Sanatorium (50 Beds). Post suitable for applicant interested in working for Primary F.R.C.S. and arrangements can be made for person appointed to attend postgraduate lectures and demonstrations in anatomy and physiology at Medical School n Newcastle.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. NEWCASTLE GENERAL HOSPITAL. DEPARTMENT OF PSYCHOLOGICAL MEDICINE. REGISTRAR PSYCHIATRIST. Department under clinical direction of Professor of Psychological Medicine, University of Durham, and is at present temporarily at St. Mary's Hospital, Stannington, Northumberland.

Applications, with names and addresses of 3 referees, to be forwarded to Regional Psychiatrist, Newcastle Regional Hospital Board, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 7 days.

NEWMARKET GENERAL HOSPITAL, Newmarket. Applications are invited for the post of HOUSE PHYSICIAN, vacant 19th September, 1955. Duties include house charge of general medical and pulmonary tuberculosis beds. The post is recognised for pre-registration, is resident and tenable for 6 months. Salary in accordance with national scale.

Applications, together with 3 recent testimonials, to Physician-Superintendent.

NEWPORT, ISLE OF WIGHT. ST. MARY'S HOSPITAL. (350 Beds.) ISLE OF WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON. Post vacant now. Approved for Pre-registration Service, and recognised for F.R.C.S.

Applications, with names of 2 referees, to Hospital Secretary as soon as possible.

NEWPORT, MONMOUTHSHIRE. ROYAL GWENT HOSPITAL. (260 Beds. 10 residents. Recognised D.L.O.) JUNIOR HOSPITAL MEDICAL OFFICER (E.N.T. and ophthalmic) required. Post covers 23 E.N.T. and 8 ophthalmic beds. Salary £775–£50–£1075, less £125 for board-residence. Good experience.

Apply, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport, Mon.

NORWICH. NORFOLK AND NORWICH HOSPITAL. Locum ORTHOPÆDIC REGISTRAR required from 17th September, 1955, pending permanent appointment. Salary £17 10s. per week in accordance with Ministry of Health terms and conditions of service. Membership of a Medical Defence Society is a condition of appointment.

Applications stating age, qualifications and experience, together with names of 2 referees, to Secretary, Hospital Management Committee, St. Stephen's-road, Norwich.

OXFORD REGIONAL HOSPITAL BOARD. Senior REGISTRAR to the Department of Medicine, Reading Group of hospitals. Appointment for 1 year in the first instance, eligible for extension up to 4 years. A higher medical qualification is desirable. Candidates are invited to visit the hospitals by arrangement with the Group Secretary.

Applications, on forms obtainable from the Secretary, Joint Committee for Senior Registrars, 43, Banbury-road, Oxford, to reach him by 24th September, 1955.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for the post of SENIOR HOUSE OFFICER, Department of Radiotherapy, Churchill Hospital, Oxford, for 6 months with effect from 1st September, 1955.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to Administrator, Radcliffe Infirmary, Oxford, as soon as possible.

OXFORD. WARNEFORD AND PARK HOSPITALS MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER wanted. Warneford Hospital (150 Beds) is an acute Psychiatric Unit, specially related to research and postgraduate teaching. The adjacent Park Hospital is a Neurosis Centre (34 Beds) with daily outpatient clinics. Previous psychiatric experience not essential. This post is specially suitable for training for D.P.M., for which full facilities are available, including neurology and child psychiatry. The post is resident with accommodation for a single man.

Further particulars may be obtained from the Physician-Superintendent, Warneford Hospital, Oxford, to whom application should be sent with the names of 2 referees within 14 days.

PAISLEY. I.D. HOSPITAL, Hawkhead-road, Paisley. JUNIOR HOSPITAL MEDICAL OFFICER required.

Applications to Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

POOLE GENERAL HOSPITAL, Poole, Dorset. Bournemouth AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (Senior House Officer) required for 12 months from 1st October, 1955. Post suitable for persons reading for higher diplomas.

Applications to the Hospital Secretary.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Royal Portsmouth Hospital (104 orthopædic and 70 surgical beds)

SENIOR HOUSE SURGEON, vacant 21st September.

HOUSE OFFICER (orthopædic), vacant now.

Queen Alexandra Hospital (73 acute medical beds)

HOUSE PHYSICIAN (non-pre-registration post), vacant now.

Applications, stating age, experience and qualifications, together with names of 2 referees, should be forwarded as soon as possible to L. C. ROGERS.

35, Grove-road South, Southsea.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post, vacant now, of NON-RESIDENT OPHTHALMIC REGISTRAR at the Portsmouth Eye and Ear Hospital with (rarely) duties at other hospitals in the Group. Preference will be given to candidates holding a Specialist qualification.

Forms of application may be obtained from the Acting Group Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him, duly completed, on or before 12th September, 1955. Canvassing will disqualify, but it is hoped that candidates will visit the Hospital by arrangement with the Acting Group Secretary.

PORTSMOUTH. ST. JAMES HOSPITAL FOR MENTAL AND NERVOUS DISEASE. GROUP 49, SOUTH WEST METROPOLITAN REGION. Applications are invited for the appointment of SENIOR PSYCHIATRIC REGISTRAR. The Hospital offers excellent experience in the diagnosis and treatment of all forms of mental illness and has separate departments for child psychiatry and neurology. Candidates should possess the D.P.M., and may visit the Hospital by appointment with the Physician-Superintendent.

Application forms may be obtained from the Group Secretary and should be returned to him, duly completed, within 3 weeks of the appearance of the advertisement.

RAMSGATE. GENERAL HOSPITAL. (101 Beds.) SENIOR HOUSE OFFICER (surgical). Recognised for F.R.C.S. and D.A. Salary £745 p.a., less charge for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary.

REDHILL COUNTY HOSPITAL, Earlswood Common, REDHILL. HOUSE SURGEON. Pre-registration post, recognised for F.R.C.S., vacant 19th September, 1955.

Apply to Group Secretary, Redhill Hospital Management Committee, Earlswood Mount, Redhill, Surrey (Redhill 3581, Ext. 20).

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) ORTHOPÆDIC HOUSE SURGEON (resident) required immediately in the Orthopædic and Accident Unit. The service consists of 100 beds equally divided between traumatic surgery and "cold" orthopædics. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications to be sent to Group Secretary, Romford Hospital Management Committee, Oldchurch Hospital, as soon as possible.

ROMFORD. RUSH GREEN HOSPITAL. (301 Beds.) RESIDENT SENIOR HOUSE SURGEON required from 1st October, 1955. Recognised for F.R.C.S. (No married quarters available.)

Applications should be forwarded immediately to Medical Superintendent, stating also names of 2 referees.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) Temporary SURGICAL REGISTRAR (Male) required. Post vacant from 13th September, 1955.

Applications should be forwarded to Secretary, Romford Group Hospital Management Committee, at Oldchurch Hospital, Romford, as early as possible.

READING AREA HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER (pathology). Previous experience in pathology desirable, but not essential. Salary £745 p.a., less £125 for board-residence.

Apply, stating age, qualifications with dates, nationality, present post, together with names of 3 referees, to Acting Group Secretary, 3, Craven-road, Reading.

READING. BATTLE HOSPITAL. (374 Beds.) Applications are invited from registered and provisionally registered medical practitioners for post of RESIDENT JUNIOR HOUSE SURGEON in the Area Accident and Orthopædic Department, vacant 1st October, 1955. F.R.C.S. recognised. Also casualty duties. Salary £425–£525 p.a., less £125 board-residence.

Apply, stating age, qualifications with dates, nationality, present position, with copy of 1 recent testimonial, to Hospital Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (401 Beds.) Applications are invited from registered medical practitioners, Male and Female, for the resident post of JUNIOR HOUSE SURGEON (gynæcology), vacant 1st October, 1955, for 6 months. Recognised for D.Obst.R.C.O.G.

Write, stating age, qualifications with dates, nationality and present post, with copy of recent testimonial, to Secretary.

RHYL. ROYAL ALEXANDRA HOSPITAL. (138 Beds.) CLWYD AND DEESIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of CASUALTY OFFICER (Senior House Officer grade) at the above Hospital. Post recognised for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, accompanied by copies of 2 recent testimonials, should be sent forthwith. to the Group Secretary, "Rhianfa," Russell-road, Rhyl.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT HOUSE SURGEON/OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON (recognised by R.C.O.G.) to run consecutively in this order from 2nd November, 1955, for a period of 6 months in each post. The posts are open to pre-registration candidates.

Apply, enclosing 2 recent references, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER to the E.N.T. Department. Post is recognised for D.L.O. and F.R.C.S. and is vacant September, 1955.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury, Wilts.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Anæsthetics, PERTH AREA. Applications are invited for the post of REGISTRAR in Anæsthetics in the Perth Area based on Perth Royal Infirmary (272 Beds) and Bridge of Earn Hospital (806 Beds). Living-in accommodation available at Bridge of Earn Hospital. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, "Bracknowe," 430, Blackness-road, Dundee, with whom applications must be lodged not later than 17th September, 1955.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Bacteriology based at Stobhill Hospital, Glasgow, which will be for 1 year in the first instance. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, by 17th September, 1955.

SCUNTHORPE AND DISTRICT WAR MEMORIAL HOSPITAL. (267 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (orthopædics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th September, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR REGISTRAR in Psychiatry required for the Pastures Hospital, Mickleover, near Derby. D.P.M. essential. House available. Appointment for 1 year in the first instance, reviewable annually. Opportunity for research and experience in those special branches of psychiatry available in the Hospital area.

Application forms and details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 19th September, 1955.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (casualty) required, 1 of 2, for busy Casualty Department. Experience provided in orthopædic and plastic cases.

Applications, stating age and qualifications together with copies of 2 testimonials, to Hospital Secretary.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL (278 Beds) AND SOUTHAMPTON GENERAL HOSPITAL (471 Beds). SENIOR HOUSE OFFICER (E.N.T.) required from 4th September. This post is recognised for the F.R.C.S. (Eng.) and D.L.O. examinations and provides experience in all branches of E.N.T. work, including audiometry. The Group includes a diagnostic and distributing hearing-aid centre.

Applications, with copies of recent testimonials, should be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) CASUALTY OFFICER (Senior House Officer), orthopædic, required for the above Hospital (Orthopædic Unit 74 Beds) immediately. This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions.

Applications, with copies of testimonials, to be submitted as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHEND-ON-SEA. GENERAL HOSPITAL. Applications are invited for the post of SECOND CASUALTY OFFICER (Senior House Officer grade) with duties in the Fracture and Orthopædic Department. Resident. Post vacant 1st October, 1955. The post is recognised for F.R.C.S.

Applications, stating age, qualifications, and experience, with copies of recent testimonials, to reach the undersigned by 8th September, 1955. J. C. FIELD, Secretary.

SOUTHEND-ON-SEA. GENERAL HOSPITAL. Applications are invited for the post of RESIDENT ANÆSTHETIST, vacant on 12th October, 1955. Senior House Officer post, salary £745 p.a., less a deduction of £140 p.a. for board. Appointment for 18 months, involving duties for 6 months at the General Hospital, Southend, 6 months at the General Hospital, Rochford, and 6 months at hospitals in the Group generally. This combined appointment has been recognised as fulfilling the conditions of the F.F.A.R.C.S. and the D.A.

Applications, &c., should reach the undersigned at the General Hospital, Prittlewell-chase, Southend-on-Sea, by 8th September, 1955. J. C. FIELD, Secretary.

SOUTHEND-ON-SEA. GENERAL HOSPITAL. Temporary CASUALTY OFFICER required (Registrar grade) for 6 months. Post vacant about 1st October, 1955. Duties chiefly in Casualty Department, which is under the supervision of Consultant in orthopædic surgery. Opportunities for work in fracture clinics in association with work of Orthopædic Department. Post recognised for F.R.C.S. if held for 6 months.

Applications, stating age, qualifications and experience, to be sent to the undersigned by 9th September, 1955.

J. C. FIELD, Secretary.

SOUTHPORT PROMENADE HOSPITAL. Resident SENIOR HOUSE OFFICER. Duties of mainly orthopædic and E.N.T. nature.

Apply, stating age, qualifications, nationality, with copies of 2 testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

STOCKPORT. STEPPING HILL HOSPITAL. (498 Beds.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (surgery) vacant 10th October, 1955. The post is recognised for the F.R.C.S.

Applications, stating age, experience, and qualifications, together with copies of 2 testimonials, to be addressed to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire, immediately.

STOCKPORT INFIRMARY. Stockport and Buxton HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (non-resident Casualty Officer), vacant 1st November, 1955. Hours of duty: 8.30 A.M.–4.30 P.M. Monday–Friday; 8.30 A.M.–NOON Saturday. The post is recognised under F.R.C.S. regulations and would suit a candidate wishing to study for higher qualification.

Applications, stating age, qualifications, and experience, together with copies of 2 testimonials, to be addressed to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. HOUSE OFFICER (medical) required. Post vacant October. Recognised pre-registration.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (845 Beds.) Whole-time SENIOR REGISTRAR in Anæsthetics. D.A. (Parts I and II) or F.F.A.R.C.S. required. Resident/non-resident. Successful candidate may subsequently be required to spend not more than 2 years in a selected hospital of the United Birmingham Hospitals in accordance with arrangements for interchange of Senior Registrars agreed by the 2 Boards.

Application forms from Secretary, Regional Hospital Board, 10, Augustus-road, Birmingham, 15, to be returned before 19th September, 1955.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (845 Beds—Recognised for F.F.A. and D.A.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Anæsthetics, vacant 1st October, 1955. Previous anæsthetic experience desirable, but not essential. The post offers experience in anæsthesia for all types of general surgery, thoracic, and cardiac surgery, including an Obstetric Unit of 60 Beds. Staff includes a Senior Registrar, who shares in emergency duties.

Applications, with necessary details and copy testimonials, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. HOUSE OFFICER (general surgery) required, vacant mid-September, 1955. Recognised F.R.C.S. and pre-registration.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

SWANSEA HOSPITAL, Swansea. (407 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the appointment of RESIDENT ANÆSTHETIST (Senior House Officer grade) at the above Hospital. The Hospital is recognised under the D.A. and F.F.A.R.C.S. regulations.

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary.

SWANSEA HOSPITAL, Swansea. (407 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of SENIOR HOUSE OFFICER in the Traumatic and Orthopædic Department of the above Hospital. Vacant 1st September. The post is recognised under the F.R.C.S. regulations for 6 months casualty training. It offers exceptional experience in all aspects of traumatic surgery as occuring in a large industrial centre and port.

Applications, stating age and experience, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary.

SWANSEA HOSPITAL, Swansea. (407 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the locum appointment for the period 19th–24th September, of JUNIOR HOSPITAL MEDICAL OFFICER in the Casualty Department of the above Hospital.

Applications, with full particulars, should be addressed to the Hospital Secretary.

SWANSEA HOSPITAL, Swansea. (407 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON (recognised for Pre-registration Service) at the above Hospital. Immediate vacancy.

Applications, with full particulars, should be addressed to the Hospital Secretary.

SWINDON HOSPITAL GROUP. (507 Beds.) Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER as Casualty Officer and Orthopædic House Surgeon at Great Western Hospital, Swindon. Post recognised by R.C.S. for 6 months of years training under Fellowship regulations. Work of Accident and Orthopædic Department, associated with Wingfield-Morris Orthopædic Hospital, Oxford, includes large number of industrial injuries. Salary £745 p.a. less £145 p.a. for residential emoluments.

Full details and names of 3 referees, to Secretary, 7, Okus-road, Swindon, as soon as possible.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE GROUP. Applications are invited for the appointment of REGISTRAR in Orthopædic Surgery for the above Hospital Group consisting of 17 hospitals with 1593 Beds. The orthopædic work is conducted mainly at the 2 major hospitals of this Group, viz., Royal Victoria Hospital, Bournemouth, and Poole General Hospital, with 100 orthopædic beds and large outpatient departments covering both traumatic and non-traumatic orthopædics in all branches, in children and adults.

Forms of application, obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Bournemouth, should be returned to him, duly completed, within 10 days of the appearance of this advertisement.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE PHYSICIAN required for post vacant 11th October. Preference given to persons seeking pre-registration post.

Applications, stating age, experience, and qualifications with dates, with copies of 2 testimonials, to Hospital Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for the Unit of Obstetrics and Gynæcology. Post recognised for M.R.C.O.G. Preference given to candidates seeking pre-registration post.

Applications, stating age, experience, and qualifications, with copies of 2 testimonials, to Hospital Secretary.

TAUNTON AND SOMERSET HOSPITAL. Applications are invited for the post of HOUSE OFFICER (E.N.T.), vacant from 1st October, 1955. Pre-registration appointment.

Applications, stating age, nationality, and qualifications, together with the names of 2 referees, should be forwarded immediately to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch.

TORQUAY. TORBAY HOSPITAL. Senior Resident HOUSE OFFICER (medicine) required 18th October, 1955. There is a complement of 5 Resident House Officers.

Applications, stating qualifications, age, nationality, with copies of testimonials (quoting Ref. F.955/61), to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

VENTNOR, I.W. ROYAL NATIONAL HOSPITAL FOR DISEASES OF THE CHEST. (249 Beds.) Required, JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (resident post). Hospital has all facilities for major thoracic surgery.

Applications, with names of 2 referees, to Physician-Superintendent.

WELSH REGIONAL HOSPITAL BOARD. Surgical REGISTRAR (orthopædics) to serve Cardiff Hospital Management Committee, based at Prince of Wales Hospital, Rhydlafar, near Cardiff (200–300 Beds). Hospital is Regional Orthopædic Centre for South Wales area. Married accommodation available. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) HOUSE OFFICER (anæsthetics). Post vacant immediately. The Hospital is recognised for the F.F.A.R.C.S. and D.A.

Applications, with copies of 2 testimonials, to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) CASUALTY OFFICER (Senior House Officer grade), vacant immediately. Post recognised for the F.R.C.S. The appointment will be for 6 months in the first instance.

Applications, with copies of 2 testimonials, to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post recognised F.R.C.S. Wide experience available under Area Orthopædic team. Appointment for 6 months in first instance. Vacant 8th September.

Applications, with copies of 2 testimonials, to the Secretary.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. Applications invited for appointment of JUNIOR HOSPITAL MEDICAL OFFICER for the Leeds Regional Thoracic Centre (59 Beds) at Pinderfields General Hospital. The Centre deals with thoracic and upper abdominal surgery in association with the Thoracic Consultants of the General Infirmary at Leeds. Salary scale £775–£50–£1075 p.a., less a charge of £155 for board, lodging, &c.

Address written applications with full particulars and 2 names and addresses for reference to—

W. BOWRING, Group Secretary.

Victoria Chambers, Wood-street, Wakefield.

WEST BROMWICH AND DISTRICT GENERAL HOSPITAL. (144 Beds.) HOUSE PHYSICIAN, vacant 1st October, 1955. Pre-registration.

Applications, with 3 recent testimonials, to Group Secretary, West Bromwich and District Hospital Management Committee, Edward-street, West Bromwich.

WOKING AND CHERTSEY GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum SENIOR REGISTRAR in Obstetrics and Gynæcology required for period of approximately 2 months from 26th September to work at Woking Maternity Hospital (54 Beds) and Woking Victoria Hospital (72 Beds). Further details may be obtained from the Consultant Obstetrician, Mr. L. G. Higgins (phone : Woking 2741).

Apply, with 2 names for reference, to Group Secretary, "Huntington," Guildford-road, Chertsey, Surrey.

WOLVERHAMPTON GROUP.

The Royal Hospital (an Associated Hospital of the University of Birmingham Medical School)

SENIOR HOUSE OFFICER or HOUSE OFFICER (Fracture and Orthopædic Department), vacant now.

2 SENIOR HOUSE OFFICERS (Anæsthetists). Appointments recognised for D.A. and F.F.A.R.C.S. Vacant October and November.

New Cross Hospital

HOUSE OFFICER (general surgery), vacant 19th September. Pre-registration post.

Apply, with copies of testimonials, to Secretary, The Royal Hospital, Wolverhampton.

YORK A AND TADCASTER HOSPITAL MANAGEMENT COMMITTEE.

York, County Hospital (Acute General Hospital of 269 beds, with full Consultant staff)

SENIOR HOUSE SURGEON in Ophthalmology. Required from 1st October, 1955. Recognised for F.R.C.S. and D.O.

Applications, giving qualifications, age, experience, nationality, and names of 2 referees, to the Secretary, Bootham Park, York.

York, Maternity and Fulford Hospitals

SENIOR HOUSE OFFICER in Obstetrics and Gynæcology. Required 1st October, 1955. Recognised for M.R.C.O.G.

Applications, stating age, qualifications, experience, nationality, and names of 2 referees, to the Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

DUBLIN. NATIONAL CHILDREN'S HOSPITAL, Harcourt-street, DUBLIN. Applications are invited for the post of MEDICAL REGISTRAR, salary £550 p.a., less £150 for quarters and messing ; 1 months leave p.a.

Applications, with full particulars, to be forwarded to the Secretary, Medical Committee, 88, Harcourt-street, Dublin.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a whole-time post as REGISTRAR in General Surgery at hospitals managed by the South Belfast Hospital Management Committee. The terms and conditions will be in accordance with the application of the Spens report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 17th September, 1955.

Public Appointments

BUCKS COUNTY COUNCIL. Applications are invited from registered medical practitioners for the appointment of DEPUTY COUNTY MEDICAL OFFICER AND DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER. Salary on scale £1675–£100(2)–£62 10s.–£1937 10s. p.a. This scale will shortly be reviewed as the population of the county now exceeds 400,000. Travelling and subsistence allowances on the Council's scale will be paid. The appointment is superannuable and subject to medical examination.

Further particulars and forms of application may be obtained from the undersigned at County Hall, Aylesbury, to whom completed applications must be delivered by Tuesday, 20th September, 1955.

R. E. MILLARD, Clerk of the Bucks County Council.

August, 1955.

DERBYSHIRE COUNTY COUNCIL. County Health DEPARTMENT. SENIOR MEDICAL OFFICER FOR MENTAL HEALTH. Applications are invited from registered medical practitioners for this whole-time superannuable post. Experience in dealing with educationally subnormal children and mental defectives is necessary for carrying out the duties. The possession of a Diploma in Public Health or in Psychological Medicine would be regarded as an important additional qualification. Salary £1415–£50(7) and £65(1)–£1830 p.a. Car allowance.

Particulars and application forms obtainable from Dr. J. B. S. MORGAN, County Medical Officer, St. Mary's Gate, Derby, to whom they should be returned by 19th September, 1955.

DERBYSHIRE COUNTY COUNCIL. County Health DEPARTMENT. ASSISTANT MATERNITY AND CHILD WELFARE MEDICAL OFFICERS AND SCHOOL MEDICAL OFFICERS. Applications are invited from registered medical practitioners for whole-time superannuable posts. Salary £975–£50–£1375 p.a. Car allowance.

Particulars and application forms obtainable from Dr. J. B. S. MORGAN, County Medical Officer, St. Mary's Gate, Derby, to whom they should be returned by 12th September, 1955.

DEVON. COUNTY OF DEVON. District Medical Officer OF HEALTH/ASSISTANT COUNTY MEDICAL OFFICER. Applications are invited for the mixed appointment of Medical Officer of Health and Assistant County Medical Officer for the Kingsbridge and Salcombe Urban Districts and Kingsbridge and Plympton Rural Districts. Apportionment of service—80% to the District Councils and 20% to Devon County Council. Salary £1623 15s.–£1891 15s. D.P.H. or equivalent essential. Diploma in Child Health and Certificate for the Ascertainment of E.S.N. Children desirable.

Particulars and application forms, returnable by 17th September, from the County Medical Officer, 45, St. David's-hill, Exeter.

COMHAIRLE CONNDAE NA MIDHE. Assistant Ortho- PÆDIC SURGEON, Counties of Louth, Meath, Monaghan, Cavan, Westmeath and Longford. Applications are invited for the above-mentioned post. The appointment is temporary and whole-time and remuneration is at the rate of £1200 a year inclusive with extra for travelling expenses.

Full details and application forms may be had from the Chief Officer, Health Offices, Meath County Council, An Uaimh, County Meath, Ireland. Latest date for receipt of completed application forms is Monday, 26th September, 1955.

EAST HAM. COUNTY BOROUGH OF EAST HAM. ASSISTANT MEDICAL OFFICER OF HEALTH. Applications are invited from duly qualified medical practitioners with experience in antenatal and postnatal work, child welfare work, and in work of the School Health Service. Salary £975–£50–£1375 p.a.

Further particulars and form of application (returnable by 12th September, 1955) from the undersigned.

R. H. BUCKLEY, Town Clerk.

Town Hall, East Ham, E.6.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointment as Appointed Factory Doctor is vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
FALKIRK ..	STIRLING ..	17TH SEPTEMBER, 1955

NORTHUMBERLAND COUNTY COUNCIL. Applications are invited from registered medical practitioners for the appointment of ASSISTANT COUNTY MEDICAL OFFICER to undertake duties primarily connected with maternal and child welfare. Salary will be in accordance with the scale of £975, rising by annual increments of £50 to £1375 p.a. Previous experience may be taken into consideration in determining the commencing salary. Travelling and subsistence allowances when applicable will be paid in accordance with the Council's scale. The appointment is subject to superannuation and will be determinable by 3 months notice on either side. The successful candidate will be required to pass a medical examination.

Forms of application and any further particulars required may be obtained from the undersigned and must be returned not later than 17th September, 1955.

JOHN B. TILLEY, County Medical Officer.

County Hall, Newcastle upon Tyne, 1.

ROYAL AUSTRALIAN NAVY

MEDICAL OFFICERS

Applications are invited from legally qualified medical practitioners for appointment as Surgeon Lieutenants in the Royal Australian Navy. First appointment is for a period of 4 years with prospect of transfer to the Permanent Naval Force or alternatively an extension of short service up to a maximum of 8 years with gratuity payable pro rata.

Minimum yearly emoluments on appointment are—married officers £1694, single officers £1479.

All money figures quoted are Australian currency, but payment of the above rates will be made in sterling currency until departure from the United Kingdom. First class "D" grade passage, including wife and family, to Australia at government expense. Uniform gratuity of £224 5s. is paid on entry.

Increment of £95 is payable on completion of 2 years service.

A gratuity of £500 will be paid for 4 years service. If a 4-year commission is extended, gratuity will accrue pro rata.

Medical Officers serve in Royal Australian Navy hospitals, ships and establishments in Australia or abroad.

The Naval Hospitals at Balmoral (New South Wales) and Flinders (Victoria) are recognised as training schools for resident Medical Officers.

Generous leave is allowed, and free travel warrants in Australia to visit next of kin are given under specified conditions.

Retirement provisions and invaliding benefits are provided by contributions to the Defence Forces Retirement Benefits Fund. These contributions are refunded if taking discharge (other than on Medical grounds) at end of short-service commission.

Full details may be obtained from the R.A.N. Liaison Officer, Australia House, Strand, London, W.C.2, or from the Secretary, Department of the Navy, Melbourne, S.C.1, Australia.

MIDDLESEX COUNTY COUNCIL. County Health DEPARTMENT. ASSISTANT MEDICAL OFFICER (Temporary whole-time) required in Area No. 7 (Ealing and Acton) for period of approximately 9 months. Duties include supervision of health of school-children, mothers and young children, attending health clinics and routine medical inspections at schools. Experience in these branches of Public Health work an advantage. Unestablished. Salary £975–£50–£1375 p.a. inclusive. Prescribed conditions.

Application forms from Joint Area Medical Officer, Town Hall, Ealing, W.5, returnable by 17th September (quote R.175L). Canvassing disqualifies.

MINISTRY OF SUPPLY. Senior Principal Scientific Officer. The Civil Service Commissioners invite applications from Men for the pensionable appointment of a RESEARCH PHYSIOLOGIST at a Ministry of Supply Research Establishment in the South of England. Candidates must have been born on or before 31st December, 1923, and must hold a first or second class honours degree in physiology or other natural science, or equivalent qualification. A candidate without this qualification but of high professional attainments may be considered. Medical qualifications highly desirable. They must have had several years experience in applied physiology, and be familiar with modern physiological techniques as applied to man. They must further be of proved research ability and be capable of taking charge of a team of research physiologists. Salary scale: £1600–£1850. Starting salary above minimum may be granted according to qualifications and experience.

Further particulars and application forms from Civil Service Commission, Scientific Branch, 30, Old Burlington-street, London, W.1, quoting S4499/55. Application form must be returned by 22nd September, 1955.

NOTTINGHAM. CITY OF NOTTINGHAM EDUCATION COMMITTEE. Applications are invited for the post of SCHOOL MEDICAL OFFICER on the salary scale £975–£50–£1375 p.a. The appointment will be subject to the provisions of the Local Government Superannuation Acts.

Further particulars and forms of application may be obtained from the Principal School Medical Officer, 28, Chaucer-street, Nottingham. F. STEPHENSON, Director of Education.

NOTTINGHAMSHIRE COUNTY COUNCIL. Public HEALTH DEPARTMENT. Applications invited from registered medical practitioners (either sex) for whole-time appointment as ASSISTANT COUNTY MEDICAL OFFICERS. Salary £975–£50–£1375, or, if holding a Diploma in Public Health, £1125–£50–£1375.

Application forms and conditions of appointment from the County Medical Officer, County Hall, Trent Bridge, Nottingham. Closing date 30th September, 1955.

A. R. DAVIS, Clerk of the County Council.

WARRINGTON. COUNTY BOROUGH OF WARRINGTON. Applications are invited from suitably qualified medical practitioners for the appointment of ASSISTANT MEDICAL OFFICER AND SCHOOL MEDICAL OFFICER (Male or Female). The salary is £975 p.a., rising by annual increments of £50 to a maximum of £1375 p.a. Experience in dealing with children is essential, but possession of the D.P.H. or D.C.H. would be an advantage. The duties will be mainly clinical in connection with Maternity and Child Welfare or School Medical Services, as may be required. A car allowance is payable. The post is superannuable and subject to a satisfactory medical examination.

Applications, giving full details of age, qualifications, and experience, together with the names of 2 persons to whom reference can be made, should be forwarded to the undersigned not later than 24th September, 1955.

ERIC H. MOORE, Medical Officer of Health and Principal School Medical Officer.

Health Department, Sankey-street, Warrington, August, 1955.

WOLVERHAMPTON. COUNTY BOROUGH OF WOLVERHAMPTON. DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER. Applications are invited for the above whole-time appointment at a salary of £1533–£100(2)–£50–£1783. Car allowance.

Conditions of appointment and details of duties may be obtained from the Medical Officer of Health, 59, Waterloo-road, Wolverhampton, to whom applications, giving particulars of qualifications, training, and experience, with names of 3 persons for reference, should be addressed by 19th September, 1955.

Town Hall, Wolverhampton. A. G. DAWTRY, Town Clerk.

Hospital Services : Non-Medical Appointments

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex University graduate with Science degree, interested in scientific research, required to work in special clinic for the early diagnosis of malignant disease in women. The successful candidate will be required to undergo a period of training before taking charge of the laboratory concerned. Salary scale £540 p.a.–£625 p.a. Commencing salary subject to qualifications. In addition London weighting is payable.

Apply immediately, stating age, qualifications, and experience, together with names and addresses of 2 referees, to Group Secretary, from whom further details may be obtained.

GATESHEAD AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR BIOCHEMIST (non-medical). Salary scale and conditions as laid down by the P.T. Council "A." Candidates must possess the prescribed qualifications and have had at least 5 years experience in the basic grade.

Applications, stating age, experience, and qualifications, with the names and addresses of 2 referees, should be sent to the undersigned within 2 weeks of the date of this publication.

H. CLARK, Group Secretary.

"The Lodge," I.D. Hospital, Sheriff Hill, Gateshead, 9.

HERTFORD COUNTY HOSPITAL, Hertford, Hertfordshire. (173 Beds. 20 miles from London.) Applications are invited for the post of MEDICAL LABORATORY TECHNICIAN who must be qualified and well experienced in pathological histology. This is a new appointment and the successful candidate will be in charge of the work and be responsible to the Pathologist. Whitley Council salary and conditions of service.

Applications, giving details of age, qualifications, experience, and names of 2 referees, to the Hospital Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY. Applications are invited for the post of SENIOR ELECTRO-ENCEPHALOGRAPHER at the Manchester Royal Infirmary. Experience in electrotechnics and in the construction and repair of electrical apparatus for encephalography and myography would be an added advantage, and a suitably qualified successful applicant would receive remuneration on the scale £585–£30–£765. The starting salary would be in accordance with the applicant's age and experience.

Applications should be addressed to Dr. F. R. FERGUSON, Department of Neurology, Manchester Royal Infirmary, within 2 weeks of the appearance of this notice.

SOUTH AFRICA. PROVINCIAL ADMINISTRATION OF THE CAPE OF GOOD HOPE: HOSPITAL BOARD SERVICE. Vacancy, GROOTE SCHUUR HOSPITAL, OBSERVATORY, CAPE TOWN. TECHNICIAN, grade B (E.E.G. Technician): Departments of Neuro-psychiatry and Neuro-surgery. Electro-encephalography Laboratory.

1. Applications are invited for suitably qualified persons for appointment to the post of Technician, grade B (Electro-encephalography), at the Groote Schuur Hospital, Observatory, Cape Town, with salary on the scale £660–£30–£750–£786 p.a.

2. In addition to the salary indicated, a cost-of-living allowance at rates prescribed from time to time by the Administrator is payable. The present annual rate is £234, payable to married male officials and employees.

3. Conditions of service are prescribed in terms of Hospital Board Service Ordinance, No. 19 of 1941, as amended, and the regulations framed thereunder.

4. Candidates for the above-mentioned post must give full particulars in regard to their training, qualifications, and experience, for example, the places and dates of training, details and dates of qualifications, and the periods and institutions where experience has been gained. Applicants must also state the earliest date on which they can assume duty.

5. The successful applicant will be required to submit satisfactory birth and health certificates and his/her appointment will be subject to the following conditions:—

(*a*) Appointment will be on contract for 5 years in the case of a citizen of a Commonwealth country or the Republic of Ireland and 6 years in the case of a citizen of countries other than a Commonwealth country or the Republic of Ireland.

(*b*) Transport expenses (third class by rail overseas and second or cabin class steamship fare and first class by rail in the Union) necessarily incurred by the successful applicant from place of residence to the place of assumption of duty in South Africa, will be defrayed by the Administration, provided that, if the contract is broken within 1 year of the date of assumption of duty the person appointed must refund to the Administration the full amount paid in respect of transport expenses and if the contract is broken within 5 years of the date of assumption of duty in the case of a citizen of a Commonwealth country or the Republic of Ireland and 6 years in the case of a citizen of another country, the person appointed shall refund to the Administration the pro rata share of the full amount above referred to in respect of the unexpired period.

(*c*) The person so appointed will be offered permanent appointment during the terms of contract but not earlier than 3 years from the date of assumption of duty or with effect from the conclusion of the contract, provided he has passed an examination in Afrikaans as second language, which examination shall not be lower than the standard required for the Junior Certificate Examination of the Department of Education of this Province, and provided further that his services and conduct during the period of contract have been satisfactory and his state of health such as will enable him to continue to discharge efficiently all the duties of the post in which he will be employed.

6. Application must be made on the prescribed form Staff 23, which is obtainable from the Staff Clerk, Room 102, South Africa House, Trafalgar-square, London, W.C.2.

7. The completed application forms must be addressed to the Director of Hospital Services, P.O. Box 2060, Cape Town, and must reach him not later than 8th October, 1955.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies

Overseas Medical Liaison Officer. Benger Laboratories Limited invite applications for the post of Overseas Medical Liaison Officer. The successful candidate will be directly responsible to the Medical Research Director and will be required to initiate and coördinate the clinical investigation in other countries of the Company's ethical medicinal products. The post is essentially one requiring wide clinical knowledge and experience, preferably gained in part abroad. The post does not carry commercial responsibilities but calls for a man of enterprise, energy and originality to seek further genuine therapeutic applications for the Company's products, and to keep abreast of medical developments abroad which may lead to the introduction of new ethical drugs. Candidate must be prepared to spend about 6 months in the year overseas. The position is permanent and pensionable. Commencing salary offered will not be less than £1500 p.a.—Applications in confidence to the Secretary, BENGER LABORATORIES LTD., Holmes Chapel, Cheshire.

Assistant Medical Officer wanted to join the long established Medical Department of the Pressed Steel Company Limited, Oxford. He must be young, certainly under 31, a good general clinician with casualty experience and be anxious to take up a permanent career in industrial medicine. Previous experience in industry is unnecessary. Salary according to B.M.A. scale, with excellent prospects for future advancement. Pension and Life Insurance Schemes.

Please apply fully, giving details of nationality, age, education, training and experience, to Principal Medical Officer, PRESSED STEEL COMPANY LIMITED, Cowley, Oxford.

Medical Officer required urgently for large Copper Mine in Northern Rhodesia for general duties but with special emphasis on anæsthetics. Main duties will consist in giving anæsthetics with modern anæsthetic apparatus in a large well-equipped hospital. Applicants should have had relevant general experience together with experience in the giving of anæsthetics for major operations. Initial salary will be £1500 p.a., plus a cost-of-living allowance currently approximately £70 p.a. The successful applicant will participate in a copper bonus scheme which at present amounts to more than 70% of basic salary, also generous pension and life assurance schemes. Leave is at the rate of 51 days p.a. which can be accumulated over 3 years. A house with basic essential furniture will be available at nominal rental on engagement. Free passages for medical officer and family provided from place of engagement.

Reply, giving details of age, experience, marital status, testimonials, &c., to R.2, MINE EMPLOYMENT DEPARTMENT, Selection Trust Building, Mason's-avenue, Coleman-street, London, E.C.2.

A leading Passenger Shipping Company has some vacancies for Ships' Surgeons. Good salary and conditions. Age between 28–50 years.—Box A.A. 307, LEE & NIGHTINGALE, Liverpool, 2.

The Wellcome Foundation Ltd. invites applications for the post of Director of the Wellcome Museum of Medical Science. This Museum is primarily a teaching museum and is devoted to tropical medicine. Applicants should be medically qualified and should have had experience in tropical diseases overseas, and in teaching. Experience in the running of a museum would also be an advantage.

Applications should reach the Secretary, THE WELLCOME FOUNDATION LTD., 183, Euston-road, London, N.W.1, not later than 31st October, 1955.

Leading Pharmaceutical Company has vacancy occurring for medical practitioner (male) to deal with medical queries, arrange clinical trials with the company's products, and other general professional advisory work. Some knowledge of languages and willingness to travel abroad an advantage. Minimum salary £1500 p.a.

Apply with full details to: Address, No. 161, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

English M.D., registered in Ecuador, U.S.A., and Venezuela; fluent Spanish, some French and German; well-travelled in Latin-America and Caribbean; experienced in general, industrial and tropical medicine, emergency surgery, medical writing and pharmaceutical industry. Seeks appointment, preferably overseas. Temporary assignment welcome.—Address, No. 157, THE LANCET Office, 7, Adam-street Adelphi London, W.C.2.

Radiologist, Consultant, now free undertake locums.—Address, No. 160, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Applications are invited for the post of Secretary to the Institute of Clinical Research, The Middlesex Hospital Medical School, London, W.1. Candidates should have some secretarial experience and will be required to show administrative ability. No specialised knowledge is needed. Applicants should give details concerning age, education, experience, and state salary required, with names of 2 referees.—Applications to the Director, THE INSTITUTE OF CLINICAL RESEARCH, 40, Hanson-street, London, W.1.

Young gentleman, 26, single, well educated, good appear-ance, seeks position as Secretary to leading Consultant, London or Home Counties. 5 years experience as Medical Secretary, fully qualified shorthand-typist.—C. E. J. AMEY, 163, High-street, Newport, I.O.W.

Consulting-rooms, full and part time, and Houses in the medical area.—ELGOOD & CO., 1, Bentinck-street, W.1 (WELbeck 8974).

To Let furnished, minimum year: Owner going East, 2 small flats as a whole or separately. Near St. Albans station; half-hour London.—Address, No. 159, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Microscopes. Highest prices paid for good modern types. Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

Austin. A.30, A.40, A.50, and A.90 Models. Limited number of orders now acceptable from proven essential users for delivery ahead.—Demonstrations, brochures, easy terms, application forms on request from H. A. SAUNDERS LIMITED, Austin House, 140–144, Golders Green-road, Golders Green, London, N.W.11.

Live Leeches always in stock.—Apply: R. Brooks & Co., Lucullus House, 4, Barbican, London, E.C.1.

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, September 3, 1955.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.

For the treatment and prevention of infection in wounds, burns, skin-graft sites, etc.

FURACIN

TRADE MARK

the potent antibacterial specifically for local application

'FURACIN' (nitrofurazone) is active, even in the presence of pus, etc., against all the bacteria that commonly infect wounds and burns, and bacteria do not acquire resistance to it. 'FURACIN' does not delay healing or interfere with the 'take' of skin-grafts. 'FURACIN' is not used systemically in human beings and is not related to either the antibiotics or the older antiseptics.

'FURACIN' Soluble Ointment
in 1-oz. tubes, and 4 and 16-oz. jars
'FURACIN' Solution
in 2, 4, and 16 fl. oz. bottles
'FURACIN' Ear Drops
in 1 fl. oz. bottles with dropper

For cost to N.H.S. please see M. & J. list of costs dated May, 1955

MENLEY & JAMES, LIMITED, COLDHARBOUR LANE, LONDON, S.E.5
Telephone: BRIxton 7851

FP65

TOPICAL THERAPY WITH

'ANTHISAN'* brand
MEPYRAMINE MALEATE
CREAM

rapidly effective antihistamine
nalgesic preparation for
tic relief in allergic
ization dermatoses
irritant skin

Detailed literature is available on request

'BRULIDINE'* brand
DIBROMOPROPAMIDINE
CREAM

A general purpose anti-infective cream for the prevention and treatment of infection in wounds and for the treatment of impetiginous skin conditions.

Detailed literature is available on request

'PHENERGAN'* brand
PROMETHAZINE
CREAM
WITH
DIBROMOPROPAMIDINE

For the rapid control of inflammation, swelling and pain, and for the prevention and treatment of infection in burns and scalds.

Detailed literature is available on request

Supplied in collapsible tubes of 1 oz. and containers of 1 lb.

*Trade mark

MANUFACTURED BY MAY & BAKER LTD

M&B Brand Medical Products MA.2640

DISTRIBUTORS: PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD · DAGENHAM · ESSEX